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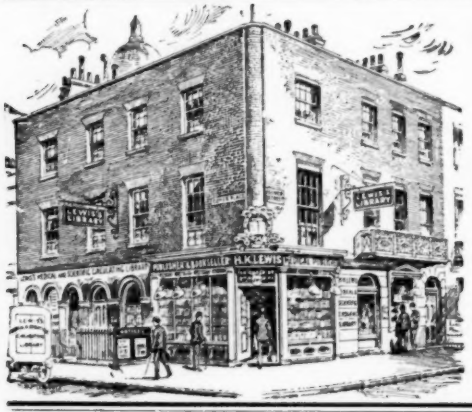

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IT is fitting that I allude to the founder of this lecture. Dr. Montgomery was a member of the staff of the Royal Victoria Eye and Ear Hospital. A man of quiet, unassuming demeanour, he was wholly devoted to his work. By his legacy he conferred a lasting benefit upon ophthalmology, and we may feel certain that the slit-lamp would have given him the greatest pleasure.

ADVANTAGES OF THE INSTRUMENT.

The introduction of the ophthalmoscope heralded the opening of a new era in ophthalmology, fruitful in discovery regarding the anatomy and pathology of the eye. Still something was wanting. The ophthalmoscope deals with two dimensions in space, and the older methods of focal illumination were inadequate to supply the third dimension; our measurements of depth, our localisation along the axis of the eye, were at best good guessing. In 1912 Gullstrand invented the first slit-lamp and incidentally supplied the third dimension. The original slit-lamp was improved and associated with the corneal microscope by Henker. Vogt added the adjustable slit which gave the "optical section." The slit-lamp and corneal microscope, as made by Zeiss, allow us to localise along the optical axis of the eye, without the use of any academic methods, within a limit of 1/5th of a millimetre. The Czapski-Zeiss microscope is provided with Ulbrich's micrometer drum, divided into tenths of a millimetre, and measures the travel of the instrument from one focus to another. With this we can gauge the depth of the anterior chamber or the thickness of the lens with fair accuracy. The micrometer eye-piece allows us to make transverse measurements, and when it is used with a goniometer, which registers the angle between the visual and illuminating axes, accurate estimations of depth can be made. This method is somewhat academic and is unnecessary for routine clinical work. The chief advantage gained by the slit-lamp is the optical section, one that we cannot overvalue; but there are others. An ordinary loupe magnifies about six times; the corneal microscope offers a stereoscopic view of the eye as far back as the anterior third of the vitreous, giving a magnification of 35. With an exceptionally steady patient we can fit a higher eye-piece and obtain 60 diameters. Personally, I think 35 quite sufficient, and I find that I obtain no advantage by using a strong eye-piece. Magnification by high-powered oculars is a cheap and nasty way of failing to attain the desired result. As Koeppe[1] says, "the resolution of the finer details of the observed tissue is essentially a function of the numerical aperture of the objective employed, and independent of the ocular magnification."

The beam of the Zeiss slit-lamp is under the most perfect control. It can be freely moved independently of the microscope up, down, right, left, and focused upon any desired spot. This allows us to use varieties of illumination and to change them automatically as occasion may dictate. By throwing the beam of light slightly out of focus we obtain a diffuse illumination which is often of value. The beam may be brought to an exact focus upon any given structure and gives direct focal illumination. We can focus it upon a reflecting surface behind the object under review and use transillumination or retro-illumination. Thus we examine the cornea by light reflected from the iris in lens-light. We can illuminate the cornea by a pencil of light reflected from the posterior lens capsule and make out fine changes which are difficult to detect by other means. (These methods are illustrated in Fig. 1.) It is often useful to take advantage of mirror light to work in the zone of specular reflection. Instead of avoiding the mirror of the light from the cornea or lens capsules, we deliberately use these dazzling zones, and are able to see on the anterior corneal surface deposits of fine drops and fine irregularities, on the posterior surface the endothelial cells, on the anterior lens capsule the shagreen and the epithelial cells, and finally the posterior shagreen. We can easily understand the advantages of the specular zone if we take an ophthalmoscope case and hold it in relation to a bright light in such wise that we get the direct reflection of the light back to our eye. We notice at once how the details of the shagreen of the leather spring into prominence. In some cases the reflection from a surface such as the iris is so intense that detail is lost. By focusing the light somewhat laterally we see our object by scattered light, by indirect lateral illumination. This form of lighting is specially used to see the sphincter of the iris.

FIG. 1.

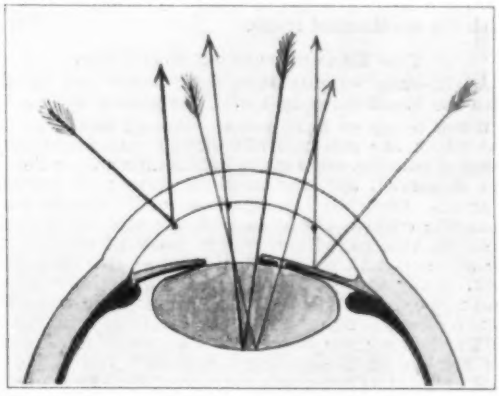


Diagram illustrating direct focal illumination of an object on the back of the cornea, retro-illumination of a similar object from the iris and from the posterior capsule of the lens, and retro-illumination of a hole in the retinal layer of the iris by lens light.

Another method of illumination has been called scleral scatter by Graves. If we bring the beam to a focus upon the limbus we at once notice a glow all round the cornea, brightest directly opposite the spot of light. The light is reflected backwards and forwards between the anterior and posterior surfaces of the cornea till it reaches the sclera, and in its passage it illuminates the corneal substance; the structure becomes relucent, to use another apt word coined by Graves. A tenuous opacity in the cornea may be seen against the internal glow when it is almost invisible by other forms of illumination.

The last available method is illumination by fundus light. Light directed against the sclera penetrates and is reflected back from the fundus. Fissures in the retinal layer of the iris glow blood-red in fundus light. It is obvious that to take full advantage of these methods which are used instinctively and alternately by the expert, the lamp-arm must move absolutely independently of the microscope. If, for example, we are examining keratic precipitates (K.P.) we light them alternately by direct focal and retro-illumination. Some objects, such as the fine filaments which cross the retrolental space, uniting the lens to the vitreous, can be seen only by oscillatory light.

* Owing to lack of space it is impossible to publish more than a selection of the drawings which illustrated this lecture. In consequence the subject-matter has been somewhat abridged and modified.

[1] American Journal of Ophthalmology, ix., 158.

THE APPARATUS RECOMMENDED.

I advise the use of the Zeiss slit-lamp. It is unwise to have anything to do with the combined slit-lamp and Gullstrand ophthalmoscope. The best lenses to get are paired objectives A 0: A 2: and A 3, ocular 2, and a micrometer ocular. I recommend the objective A 0 instead of F 55. The latter magnifies only nine times, and I regard it as a pretty toy. A 0 is a useful lens, magnifying 15 times. It serves most purposes and is easy to use. It is not powerful enough to see the endothelium in detail or to observe small particles in the aqueous. A 0 has been little used as yet, but I have recently obtained one and I find that I am employing it more than any other. I greatly prefer the glass-top table to the double slides for moving the microscope. This mechanical stage is easier to use, but is a handicap to the expert. Using A 0 and the glass top it is possible to focus the microscope by sliding it on the glass; it can be instantly slewed at will, and the movements of the patient can be followed automatically, for we hold the microscope by the screw which raises and lowers it and so we have complete control with one hand. This is not possible with the mechanical stage.

THE EXAMINATION BY SLIT-LAMP.

A slit-lamp examination falls under two heads, with the broad beam and with the narrow beam.

When a ray of light passes through media in the eye which are not optically homogeneous but composed of lamellæ, some of the light is internally reflected and dispersed, and the medium glows; it becomes relucent. Optically homogeneous media remain dark. Thus the cornea, the lens, and the vitreous become relucent, whereas the epithelial layer of the cornea, the aqueous, and the retrolental space, remain almost dark. I say almost, for an optically inactive medium does not exist in the eye. The appearance when the narrow beam is thrown into the eye is seen in Fig. 2. To the left we see a scimitar-like crescent of light, the section of the relucent cornea. The adjacent dark area is the anterior chamber. The lens is on the right and shows areas of optical discontinuity. To the extreme right we may note the faint glow of the vitreous. Careful focusing will allow us to make out the architecture of the vitreous, which in section shows as a series of sinuous waving bright lines, the edges of the membranes which compose the organised part of the vitreous. In most slit-lamp drawings the whole structure is shown in sharp focus, but in reality this is not the case. This figure shows the optical section of the eye, the organ is seen in profile; we have gained our third dimension.

In Fig. 3 we see the effect of throwing the broad beam into the eye. A block of light is seen in the area of the cornea, the *prisma* in German. Although it is not a geometrical prism, it is convenient to use the word prism to describe this relucent block. The cortical layer of the lens forms a second prism. The lens prism is not so sharp as the corneal and the posterior surface is more strongly curved than the anterior. It is very important to differentiate this prism, because its posterior surface is the face of the adult nucleus, a landmark in the lental landscape. Behind the prism we generally see the posterior inverted Y, another prominent landmark marking the posterior surface of the embryonic nucleus of the lens. The anterior erect Y is generally very difficult to detect.

We can now pass on to a more detailed study of the eye as seen with the slit-lamp, taking the structures in anatomical sequence.

THE CORNEA.

The corneal prism is shown in Fig. 4. The surface to the left is the epithelial surface of the cornea, the darker surface to the right marks the margin of the beam of light—we call it the proximal section. There is a distal section, but this is invisible. Looking through the prism we focus upon the endothelial surface of the prism. This reflects light faintly, and in the young normal cornea is not obvious. In the aged, and after interstitial keratitis, the endothelial surface reflects light strongly and stands out clearly as a somewhat opaque granular surface. It is possible to see the epithelial layer of the cornea; if we overrun our lamp, using a voltage of 10 instead of the usual 8, and focus sharply upon the extreme distal edge of the epithelial surface of the prism, we see a clear layer—this is the optically inactive epithelial layer of the cornea.

Reverting to the normal prism as shown in Fig. 4 we note that the stroma is granular in appearance. In the outer two-thirds of the prism the corneal nerves are seen. At the periphery they are thick and medullated, but as they enter the transparent cornea they lose their medulla, and look like threads of cotton. They divide dichotomously and occasionally show a web-like formation in the angle between two twigs. We see no trace of Bowman's tubules or of Recklinghausen's canals. Leber has shown that these structures are artefacts. Koeppe, using magnifications of 60 and 80, has described an elaborate system of lymph passages, but his observations have not received confirmation.

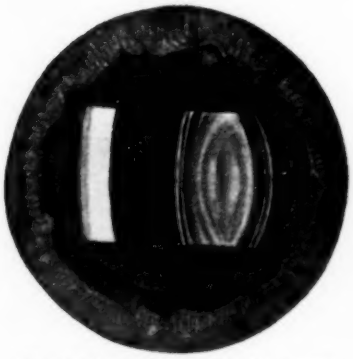
If we examine the endothelial surface of the cornea in the zone of specular reflection we see a yellow shagreen area, which on careful focusing resolves itself into a mosaic of hexagonal cells, the endothelial layer of the cornea. Among the cells there are dark crater-like formations. These may in part correspond to the Hassal-Henle warts, thickenings, of Descemet's membrane. In the pig's eye the endothelial cells are very large and their nuclei are seen as dark dots in the centre of the cell. In man the nuclei are held to be invisible, but we recently examined a miner and found that his endothelial cells were abnormally large, and we were able to see the nuclei distinctly. Bowman's and Descemet's membranes are unseen till they fall into folds. Such are very common in Descemet's membrane, and form after operations and accidents which perforate the cornea, and in corneal inflammation and œdema. They are seen in great profusion in interstitial keratitis. The folds may take various forms. After a central keratitis the wrinkles in both Bowman's and Descemet's membrane—fine in the former, coarse in the latter—radiate star-like from the centre towards the periphery of the cornea. Those seen after operations spread from the scar and have a double contour with silvery edges. They rapidly disappear as the healing of the wound progresses.

Ulceration of the cornea can be minutely examined with the slit-lamp. When the beam is thrown on to the ulcer we note a deep notch in the prism, and by moving the beam over the surface of the ulcer we obtain a series of contour lines which supply a complete map of the configuration of the ulcer. We can follow the process of healing and the onset of vascularisation in all its details.

Bullous Keratitis.—In this condition the detachment of the epithelium can be viewed in section, and when the cornea is superficially vascularised we can locate the pannus just under the epithelium.

The Visible Circulation.—If one of the smaller vessels in a pannus or a deep vascularisation be examined by retro-illumination so that the vessel is seen by transmitted light, using the iris as a mirror, the actual circulation of the blood is clearly perceived. Globules are observed coursing along the capillaries. In the very smallest the flow is intermittent as described by Krogh. In others the corpuscles are at intervals projected along the vessels like shots from a machine-gun. In a small twig joining two larger trunks the flow may be rhythmically reversed. It is most fascinating to watch the phenomena of the circulation with the corneal microscope under the illumination of the slit-lamp. It is probable that the globules we see are the actual corpuscles. In a favourable case the blood stream can be seen with an ordinary loupe with the illumination of a half-watt lamp.

FIG. 2.



Illumination of the eye by the narrow beam.

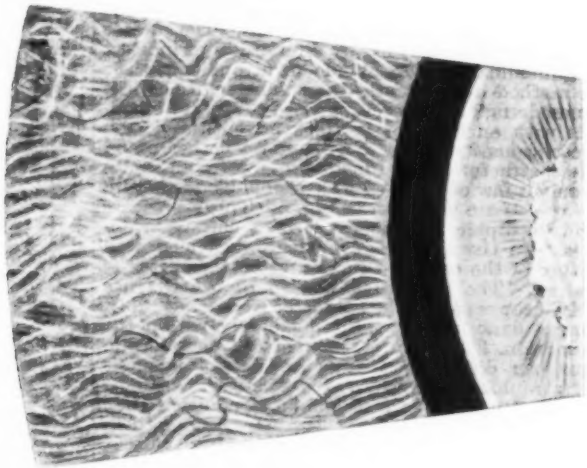
FIG. 3.

Illumination of the eye by the broad beam.

FIG. 4.

The corneal prism. Light coming from the left. Shows corneal nerves.

FIG. 5.

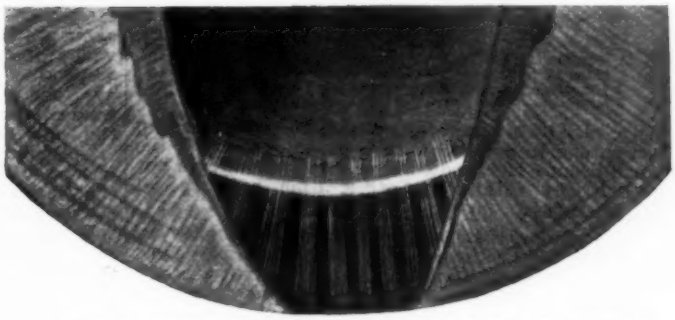


A highly atrophic iris. The sphincter is clearly seen. Blood-vessels of the iris, some of which are functional and others are mere fibrous strands.

FIG. 6.

A normal iris showing the frill from which arise filaments of the pupillary membrane. A few stars on the anterior capsule.

FIG. 7.



Congenital coloboma of the iris exposing a normal zonular ligament.

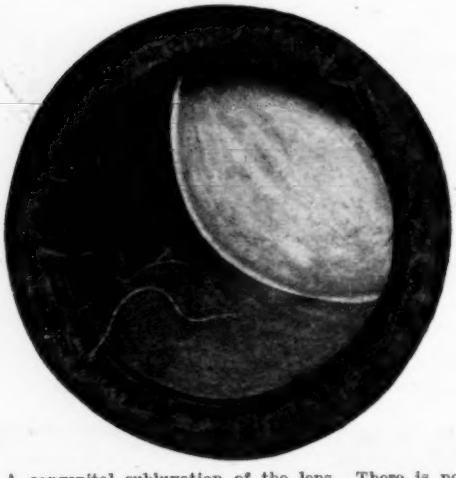
THE IRIS.

The examination of the iris presents no difficulties. We must not forget that in a light-coloured iris the mesodermal layers are semi-transparent. The surface of the iris can be examined by direct focal or indirect lateral illumination. In a blue or atrophic iris the latter method demonstrates the sphincter of the iris. The mesodermal layers are composed entirely of blood-vessels with an enormously thick adventitia, joined by loose connective tissue. I doubt whether many of these structures are functional, for in an acute iritis only a few of them carry a visible blood stream. These vessels are well seen in Fig. 5. This represents a highly atrophic iris the result of a chronic irido-cyclitis. To the right we see a shrunken lens with a rupture of the capsule through which the cortex is herniating. The pigmented margin of the iris has entirely disappeared. The sphincter is clearly visible, forming a dark brown zone immediately within the pupil margin. The anterior layer of the mesodermic portion has disappeared and the deeper layer is highly atrophic. The white strings are the remains of the arteries which form the main structure. They are now small in number and sclerosed. Among them a few are functioning as blood-carrying vessels. Heterochromic cyclitis is another form of iris atrophy which can with advantage be studied with the slit-lamp. (Pictures of this condition can be found in illustrations to the Doyne Memorial Lecture.) In this disease the posterior retinal layer of the iris is atrophic and eventually disappears over considerable areas. When such an iris is examined by light reflected back from the lens the atrophic patches transmit the light which shines through and gives the iris a moth-eaten appearance.

THE LENS.

Our knowledge of the anatomy and pathology of the lens has been almost revolutionised by the slit-lamp. By its aid we are now able to see it in sharp section and to map it out into zones. Seen with the broad beam it is found to have, not two surfaces but several, one within the other, each with special characteristics.

FIG. 8.



A congenital subluxation of the lens. There is no trace of a suspensory ligament. Vestigial fibres of the suspensory ligament spring from the frill.

The Pupillary Membrane.—All ophthalmologists are well acquainted with the anomaly known as persistent pupillary membrane, but till quite recently it was not realised that vestiges of the structure are very common. With the loupe we frequently observe a small collection of pigment dots upon the anterior capsule of the lens. These are not evidences of a past iritis but vestiges of the tunica vasculosa lentis anterior. Under a magnification of 35 they are seen to be stellate and generally tripolar. The arms of the stars are prolonged as grey fibrils which often anastomose with another star forming a rough network. These stars may be infrequent; perhaps one only may be found, or they may form a dense brown film which impedes vision. We occasionally see fine cobweb-like threads arising from the iris frill or small circle running across the anterior chamber either to join the frill on the opposite side or to float free in the aqueous. These vestiges invariably arise from the frill, and never from the pupil margin. The anterior mesenteric leaf of the iris takes little part in the movements of the iris, so these telegraph-like wires remain in tension when the pupil contracts. An example of this condition is shown in Fig. 6.

FIG. 9.

Lamellar cataract in an adult caused by a cerebral abscess at the age of 13. (The embryonic nucleus has become too distinct in the process of reproduction.)

The Suspension of the Lens.—The lens is suspended in the eye by the zonule of Zinn just as the hub of a bicycle is hung by the spokes. It does not lie upon the vitreous, but is surrounded before and behind by the aqueous humour. There is a perilental and a retrolental space both in free communication with the posterior chamber. If this arrangement is disturbed, if the anterior chamber is abolished and the lens touches the cornea, its nutrition suffers and nuclear cataract forms. I believe that the same is true of the retrolental space, and that the cause of senile nuclear cataract is to be sought in degeneration of the vitreous and disappearance of the retrolental space. The zonule of Zinn is a beautiful structure under the corneal microscope. The fibres are attached to the lens before and behind at some distance from the equator, and pass back between the ciliary processes to be inserted into the ora serrata and the vitreous. This arrangement would incline to draw the lens backwards, but this tendency is neutralised by another set of fibres which pass forward to be attached to the ciliary processes. I have seen fibrils taking this direction. The main strands, each consisting of about seven fibres, number about 140 and lie in the valley one on each side of a ciliary process. The suspensory ligament cannot be seen in the normal eye, but is visible in cases of subluxation and in congenital colobomata of the cornea. A drawing of the latter abnormality is shown in Fig. 7.

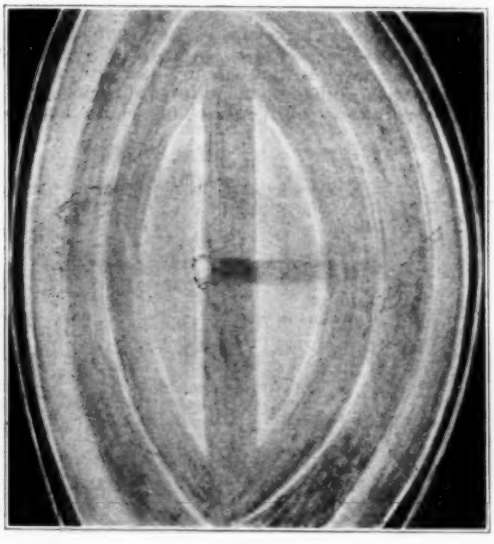
Congenital dislocation of the lens is seen in three forms: in what we may call the decentred lens the zonule of Zinn is perfect; in the ectopic lens the suspensory ligament is imperfect; and in the subluxated lens it is entirely absent. An example of the latter form is shown in Fig. 8. Here the lens is displaced and there is no trace of the zonule, but several vestiges of the pupillary membrane are present. This classification has not only academic but clinical significance. The first kind will not become displaced into the anterior chamber or fall into the vitreous, and will be difficult to extract; the last is liable to

wander in the eye, and is easier to remove; the third variety occupies an intermediate position.

THE LENS STRUCTURE.

The slit-lamp shows that the lens has a most complicated optical structure. When viewed with the narrow beam it shows a series of concentric lamellæ of varying hue and refringence. These zones of optical discontinuity may be considered from two standpoints. They may represent merely regions of slightly varying refractive index, or express definite anatomical areas, dissimilar in physiological properties, reacting differently to toxic influences and to trophic disturbance. Both views are correct. The lens is an epithelial structure and grows constantly throughout life. The epithelial cells lay down fibres layer by layer like the annual rings of a tree. If there has been no modification of nutrition during childhood we should expect a homogeneous lens, and we often find it. The lenses of some children are almost devoid of zones, whereas other children of the same age possess a lens showing a varied landscape. We may reasonably suppose that the life of the first child has been regular and nutrition uniform. The second may have been subject to rhythmic subtle alterations in nutrition which are reflected in the lens. It would be interesting to investigate the history of several children to discover harmony between the lens architecture and alterations in general health. It is certain that under conditions of markedly abnormal nutrition the deposition of the lens fibres is profoundly modified, and we may get zones in which their actual structure is pathological. Lamellar cataract is a condition of this kind associated with general evidence of malnutrition such as tetany and ridged teeth. Similar changes are seen in the finger-nails. I recently

FIG. 10.

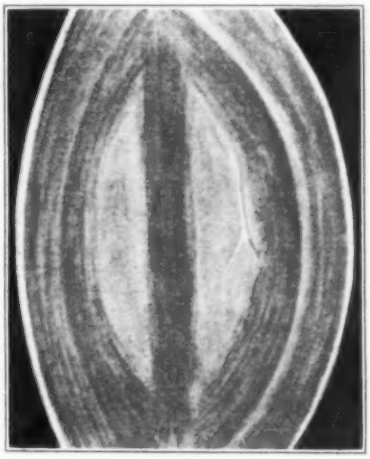


A typical adult lens of the conventional type. The central axial cataract throwing a shadow backwards is found in 25 per cent. of all lenses.

examined a patient with lamellar cataract, which is shown in Fig. 9. Here the opacity is outside the infantile nucleus, and I dated it as commencing at about 13 years of age. Subsequent inquiry elicited the fact that when 13 years of age the child had suffered from a cerebral abscess with acute ear symptoms. She had had a mastoid operation and had been trephined. She was acutely ill for a long time and in bed for nearly a year.

In addition to minor optical zones there are in the lens definite anatomical tracts. Fig. 10 illustrates what we may call the Vogt conventional lens; I made the drawing from an actual patient, but such lenses are uncommon. Commencing from without, we first note the capsule, a bright scintillating line bounding the lens figure before and behind. The capsule has a very tenuous outer layer, the zonular lamella, to which the fibres of the zonule are attached. This may be seen with the slit-lamp when it becomes detached. Under the capsule there is a clear zone bounded internally by a well-defined bright non-scintillating line, the subcapsular or reduplication line. This line is generally present, but occasionally in the aged and the young it cannot be made out with the ordinary apparatus. The yellowish zone under the subcapsular line we call the cortex. This region is in the adult separated from the central nuclear system by a well-defined surface, which in later life reflects light strongly. This is the face of the adult nucleus which appears at about 12 years of age. Within the adult nucleus we have what I prefer to call the infantile nucleus, but which Vogt calls the outer embryonic nucleus. Centrally, we find two plano-convex bodies, the embryonic nuclei. These are separated by a dark space, the central lucid interval. This is the oldest part of the lens and is invariably present. On the posterior surface of the anterior lens of the embryonic nucleus there is an axial opacity which throws a dense shadow backwards. This is almost physiological for it is found in 25 per cent. of all lenses (Vogt). The curvature of the successive zones from without inwards increases up to the infantile nucleus, after which they become concentric. Not only is the curve sharper towards the centre, but in the young there is often a tendency to a reverse curve equatorially. This becomes very obvious in cases of lamellar cataract. Probably this system of curves corrects chromatic aberration and the plano-convex lenses at the centre neutralise spherical aberration. Fig. 11 is a child's lens. In this particular example there was no subcapsular line and the adult nucleus had not yet formed. The surface of the infant nucleus divides the lens into cortex and nuclear system. The whole lens tends to be homogeneous and the yellow tinge of the cortex has not appeared. We used the narrow beam to obtain the sectional view of the lens that we have been discussing. With the broad beam we can differentiate the surfaces with their characteristic suture systems.

FIG. 11.



The lens of a child of 6. The posterior inverted Y is seen on the surface of the nucleus. No subcapsular line could be seen in this particular lens.

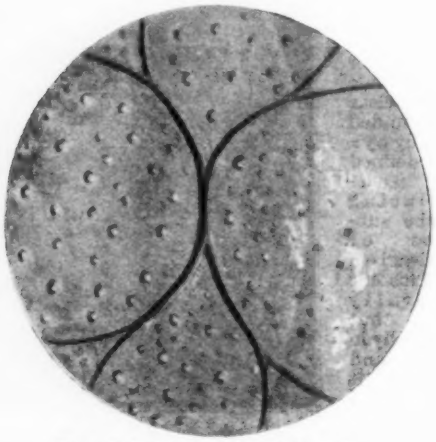
The *surface of the capsule* showed the shagreen which was well known long before the slit-lamp. It can be seen with the ordinary loupe under appropriate arrangement of illumination. In the shagreen the epithelial cells are seen, and occasionally it is iridescent. Slight iridescence, especially when a large surface is seen with the loupe, is physiological, but excessive colour sheen indicates early cataractous changes in the lens. With the loupe we can see the complicated suture system of the cortex.

The *sutures of the adult nucleus*, especially in the aged, have a most characteristic appearance which is

shown in Fig. 12. They are raised cameo-fashion from the surface of the nucleus in front, whereas behind the sutures are seen as an intaglio. Often the surface is covered with bosses which may take the place of the sutures, giving a hob-nail boot appearance.

The *primary embryonic sutures of the lens*, the anterior and posterior Y's, characterise the surface of the embryonic nuclei. Contrary to what is stated

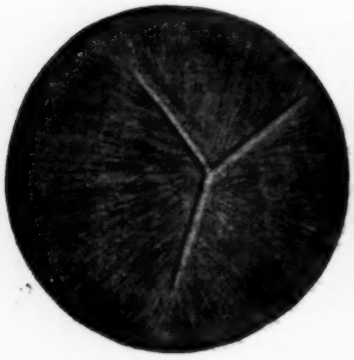
FIG. 12.



The relief sutures of the adult nucleus.

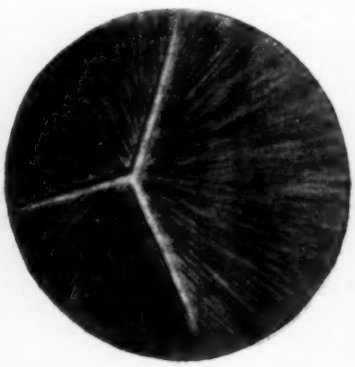
in all the text-books, the anterior Y is erect and the posterior inverted. This mistake is curious, for the anterior Y is occasionally in lamellar cataract visible to the naked eye. The lens fibres can be seen arising from the Y sutures. They start from the tip of one Y and run round to the bifurcation of the other. Thus, the fibres take a spiral course, and are all of approximately the same length. The two Y's are shown in Figs. 13 and 14. If we follow the nasal arm of the posterior Y to its bifurcation we shall see a white ring or part of a ring, often with some granulation or slight pigmentation. This is the arc-line (Vogt's *Bogen-Linie*), the situation where the hyaloid arteries were attached to the lens. Hanging from the arc-line we see, in most children, the hyaloid artery looking like a spiral piece of thick string. In later life this generally falls off leaving a stump. The artery is seen in Fig. 15. The fundus drawing (Fig. 16) shows a persistent hyaloid ending in a mushroom. The anterior part of the hyaloid was found to be normal. The anterior two-thirds had separated normally from the posterior third which had failed to absorb. I am indebted to Miss Ida Mann for the information that the hyaloid normally separates in this situation; the posterior half absorbs, the anterior commonly persists.

FIG. 13.



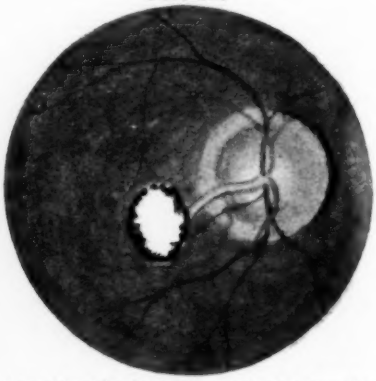
The anterior erect Y showing lens fibres.

FIG. 14.



The posterior inverted Y. Both these Y's are generally inclined at the same angle.

FIG. 16.



A persistent hyaloid artery springing from the optic nerve head and ending in a disc. Anterior part of the same artery is seen in Fig. 15.

CATARACT.

If the aqueous contains toxins the capsules and the cortex will suffer first. A typical example is naphthaline cataract. The posterior capsule is especially prone to be affected by toxic influences. In certain cases of low-grade cyclitis and choroiditis the vitreous degenerates and the posterior capsule shows alterations. The most striking evidence of this is pronounced iridescence of the posterior capsule, which shows a mother-of-pearl sheen with sparkling points of metallic lustre. This change heralds the advent of cataracta complicata. The posterior shagreen is always more lustrous than the anterior, and slight iridescence is not uncommon and is compatible with health. Vacuoles form under the capsules. They vary in size and shape, and are easily seen with the ophthalmoscope.

The commonest form of senile cataract takes the form of cortical striæ. These spicules are developed in the following manner: the cortex begins to split into lamellæ, the *lamellärer Zerklüftung* of Vogt. These rifts in the cortex do not follow the path of the lens fibres or of the sutures, but run diagonally across the cortex. Seen in section the lamellar separation causes a sort of herring-bone appearance. Comparatively clear spaces filled with fluid now form between the lamellæ, the *Wasser-Spalt* or fluid-cleft. These fluid-clefts may enlarge and run together so that a large area of the cortex may become perfectly homogeneous and pellucid in appearance. This phenomenon explains those cases of cataract in which a decided improvement of vision takes place. Generally, however, the clefts fill up with solid material and form opaque spicules.

Fibrillation of the adult nucleus is frequently seen, but in this case the process consists in a separation of the actual fibrils. The adult nucleus is the favourite seat of punctate opacities. In cataracta punctata cœrulea these have a blue colour, and are generally associated with club-shaped peripheral opacities, the cataracta coronaria of Vogt. This is an acquired cataract and is slowly progressive in some cases. In the optical section the opacities are seen to lie in the adult nucleus.

The infantile nucleus is the usual situation of lamellar cataract. In this form we get a wreath of scintillating particles giving the appearance of artificial ice. A cataract of this type has been shown in Fig. 9.

Central cataracts are generally familial. A typical example is shown in Fig. 17. The central sphere is considerably smaller than the embryonic nucleus, showing that it originated very early in the development

of the lens. The sutures are exterior to the confines of the opacity. The drawing shows the view with the loupe and a section made with my pocket slit-lamp.

Nuclear cataract begins as an excessive sclerosis of the central portion of the lens. The sclerosed nucleus

FIG. 15.

The arc-line and the vestige of the hyaloid artery hanging down in the retrolental space. It is found in 75 per cent. of all children, but falls off in later life.

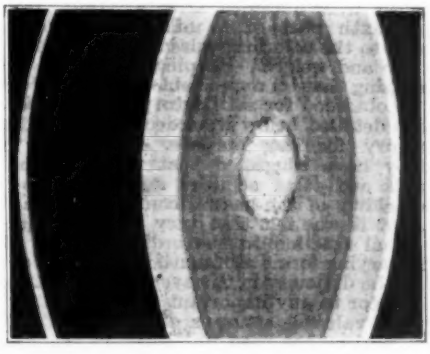
is always surrounded by a transparent zone and is at first itself transparent. In a typical example the cortex is normal, the clear zone is strongly differentiated and within it we see the sclerosed nucleus, greenish in front, yellowish to brown behind. Later on the nucleus will grow, especially axially; its curvature will increase, and its contour will be less sharp and eventually blurred. Finally, its surface may become crenellated. This is the condition known to the text-books as myopic degeneration of the lens. If the index of refraction should rise in relation to that of the cortex we have the lens with a double focus because the axial portion has a greater dioptric strength than the periphery. Fortunately, the pupil of the aged is small and the actual effect is myopia and sometimes irregular lental astigmatism. Such lenses have been described as suffering from lenticonus posterior. This condition is very rare and is quite a different thing. In a more advanced stage of nuclear sclerosis, figured in the Doyne lecture, the cortex was full of fluid-clefts, and there was high-grade sclerosis of the nucleus with increased curvature. Vision with minus 8 was 6/12. The surface of the adult nucleus seen in section gave the impression of an internal capsule. It was covered with nodules which appeared in the section as definite knobs. Each threw a dense shadow backwards. Nuclear sclerosis passes gradually into nuclear cataract if the nucleus becomes opaque. Often the bronze colour seen in the early cases deepens and we obtain the brown and black cataracts. Nuclear cataracts may rapidly form without passing through the sclerotic stage when the nutrition of the lens suffers, as for example if the anterior chamber is abolished and the lens comes into contact with the cornea.

MEDICO-LEGAL VALUE OF THE SLIT-LAMP.

I can only briefly allude to this subject, which is of immense importance. In industrial towns we are frequently called upon to decide whether a fragment of metal which has struck the cornea has actually perforated. In the majority of cases the slit-lamp will at once supply the answer. If we focus the beam upon the scar we are able to decide whether the track of the fragment passes through the cornea, by noting that it is visible on the endothelial surface. In a case under our care there was a wound traversing the cornea. An opening was visible in the anterior capsule and a passage could be traced right through the lens ending in a wound of exit in the posterior capsule. Here the cortex was softening and exuding into the retrolental space. This afforded an additional proof that the posterior surface of the lens is bathed in the aqueous which had entered the lens, causing a cataract by dissolving the cortex, just as it does after a discission of the anterior capsule.

In another case I had removed a fragment of steel from an eye by the posterior route with the giant magnet. Fortunately, I had made full notes with drawings. Perfect recovery took place with full acuity. The patient was not seen for ten years, when he appeared with a cataract in the wounded eye and siderosis. The natural conclusion was that there had been two foreign bodies and that one only had been removed, for there was no history of any subsequent accident. There was a wound in the iris that did not appear in the original drawings, but this could in a court of law have been put down to defective observation. The slit-lamp at once supplied the correct solution. The original wound was still visible in the cornea but only at an entry and an exit scar. Between the two the corneal substance had become clear. Another penetrating wound was found in the cornea showing a continuous track from front to back. This was a much younger injury and the corneal stroma had not become transparent. It was obvious that this wound and the unrecorded iris wound were recent events, and that there had been two separate perforations of the eye by a fragment of steel. The eye

FIG. 17.



A familial central cataract. Optical section made with the author's pocket slit-lamp. Magnified six times with an ordinary loupe.

was removed and the fragment found in the vitreous. The cases might have been of great importance had the man been working for two employers, for obviously the first would have had no liability for the second accident.

Many of the drawings shown at the lecture but here omitted are to be found in: The Doyne Memorial Lecture, *British Journal of Ophthalmology*, vol. viii., p. 561; the *Transactions of the Ophthalmological Society*, vol. xliv., p. 57, vol. xlv., part 2, p. 657; and the *British Medical Journal*, May 31st, 1924.

THE EXAMINATION OF THE GASTRIC CONTENTS IN INFANTS,

WITH SOME CONSIDERATIONS AS TO THE VALUE OF LACTIC ACID MILK IN INFANT FEEDING.

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THIS inquiry was instituted in view of the increased stress laid on the importance of the acidity of the gastric contents in disorders of the digestion in young infants. It was felt that it would be of interest to ascertain whether any relationship could be established between the type of milk given, the acidity of the gastric contents, and the clinical symptoms shown by the infant. The absence of free HCl in the gastric contents of infants under 1 year, after any type of test-feed, corresponding to a normal feed for such an infant, requires to be made clear, since some authorities have written in such a way as to suggest the presence of free HCl in these cases. Free HCl is found in the resting juice, or following the administration of barley water, or a very small feed, but not during the digestion of an adequate meal. In many cases 1 oz. of sweetened barley water was given at intervals of 3–4 hours after the last feed, and the stomach contents withdrawn 10 minutes later. In all cases where no food remained in the stomach free HCl was present, but in those cases where there was delay in emptying, and curd remained in the stomach from the last meal, free HCl was absent. We have also found that if a very small feed is given —e.g., a 60 c.cm. feed to a child of 4–6 months— and there is no delay in the emptying of the stomach, so that at the end of an hour only 5–10 c.cm. remain, with practically no curd, then free HCl is found. Any discrepancy between our results and those of some other observers [1] [2] who have found free HCl at varying periods after a feed may be explained by the size of the feed given. All the results quoted in our tables were obtained after a "full" feed—i.e., the one-sixth part of a milk mixture considered adequate to the caloric requirements of a child of the given age and weight. Keeping these facts in mind, and realising that an appreciable quantity of material must be obtained for satisfactory chemical tests, the methods detailed below were decided on as the most satisfactory for our purpose. American workers especially have suggested that the value of lactic acid milk and other acidified milks depends on the higher acidity of the gastric contents obtained with them, but it was felt that very little was known of the normal reaction to the ordinary types of milk used in varying forms of infantile dyspepsia, and that possibly the difficulty in the average case was not due to this factor to any important extent.

A very valuable synopsis of the recent literature on this subject has been published in the *American Journal of Diseases of Children* (May and November, 1925) and those interested cannot do better than study these articles. It is frequently difficult to obtain access to the American journals in which most of the publications have appeared.

The work of Faber [3] and Marriott [4] on the value of acidified milk in infant feeding, considered to be due to the neutralisation of the variation between cow's milk and human milk in buffer content, is fairly well known, though acidified milk has not yet been used to any great extent in this country as compared with America. Faber has shown that gastric lipase is fully active at a pH of 4·5 and 4·0, while pepsin acts from pH 5·0 but does not reach its full activity till pH 2·3. This last figure implies the presence of free HCl and is very rarely, if ever, reached in the infant's stomach during normal digestion. In order to obtain a pH concentration of 4·5 much more acid secretion is required for cow's milk than for human milk owing to the higher buffer content due to phosphates and calcium caseinate. Faber and Marriott believe that the difficulty of successful feeding with cow's milk is due essentially to this factor and can be overcome by the use of acid milks, whether hydrochloric acid or lactic acid be used, and both observers use milk little if at all diluted, and with a high fat percentage, Faber using HCl in preference to lactic acid milk. Marriott adds carbohydrate in the form of corn syrup. Lactic acid milk can be used from birth, but hydrochloric acid milk is not recommended till after the sixth week. While the value of acidified milk feeding in certain cases is not disputed, it was felt that the results obtained were possibly not due to the change in the pH concentration only, but that other factors were coming into play. In souring the milk a light flocculent curd is obtained, and it is necessary to break this up before administering the milk to the infant, therefore an actual change in the physical quality of the milk is present as well as a chemical change, and this may be of considerable importance. Excellent results have been obtained in several cases at the Carnegie Institute by simply curdling milk lightly with rennet, breaking up the curd, and giving this to the infant. In the average infant's stomach very little remains at the end of two hours; so much was this found to be the case that the test-meals were usually removed at the end of one hour. There is, then, no doubt that ordinarily the bulk of digestion takes place in the bowel, and that beyond physical changes in the milk preparing it for bowel digestion, digestion in the stomach is of relatively little importance. It was thought possible that the higher acidity of soured milk and the change in the curd might ensure a more rapid passage from the stomach, and thus be of value especially where vomiting is a prominent feature. It will be seen that this was not found to be the case. On the other hand, as bowel digestion takes place in an alkaline medium it seems doubtful if there can be any advantage in pouring a more acid food into the bowel. It is an interesting speculation as to whether such an increased acidity in the duodenal contents stimulates the pancreas, liver, and duodenal glands to increase their secretions or not. So far this remains a speculation, but in the case of a feeble and marasmic infant it seems probable that any response which could be evoked would be feeble. Recent work by Schiff and Gottstein [5] on the reaction of the duodenal contents after the administration of acidified milk mixtures is of interest. They seem to show that acidified food does not produce any prolonged acidification of the duodenal contents. Consequently it seems probable that some increase in alkaline secretions must occur. Other workers in this field may also be quoted—for instance, Hahn obtained a pH of 5·0 at the height of gastric digestion, a result confirmed by Salge, and this according to Van Dam is the optimum reaction for rennin and also according to Davidsohn for gastric lipase. [6] This corresponds closely with Faber's views and again shows the usual absence of free HCl at the height of digestion.

Method.

The stomach contents were withdrawn one hour after a feed, and the amount noted. This was filtered and the pH estimated colorimetrically. The HCl deficit and the total and combined acidity were estimated by titration against N/10 NaOH, using in the first case Congo red and in the second phenolphthalein as indicators. Each feed represented one-sixth of the caloric requirements of the individual infant.

The infants available for study were those admitted to the observation ward of the Carnegie Institute; a large percentage were suffering from different types of infantile dyspepsia or enteritis, but normal infants were also studied, including those who were admitted with their mothers for the restoration of breast feeding, and others suffering from mismanagement. The

number studied could have been larger with advantage, but the results correspond very closely with those of other observers where they are comparable and may therefore be taken as accurate averages.

TABLE I.

Food.	pH of gastric contents withdrawn after one hour.	Percentage of food left in stomach.	No. of cases.
C. M. and water p.a. with sugar	4·8	27	13
Above with 10·15 gr. p.a. sod. bic.	5·6	24	5
Above with 20 per cent. HCl	3·7	36	2
Whole C. M. with sugar	4·9	46	11
Acidified whole milk (culture)	4·0	56	11
Citrated whole milk (sod. cit. gr. 2 to 1 oz.)	5·3	63	9
Unsweetened condensed milk with sugar (1·6)	4·8	40	9
Breast milk	4·8	35	4
Whey reconstituted from whey powder	6·0	43	5
Dried Milk	4·9	32	8

C. M. = Cow's milk.

TABLE II.

Food.	No. of cases examined.	HCl deficit.	T. and C. acidity.	Buffer value and free fatty acids.	Percentage of food in stomach after one hour.
C. M. and water p.a. with sugar	24	25	29	54	27
Above with 10–15 gr. sod. bicarb.	5	51	19	70	24
Above with 20 per cent. N/10 HCl	2	29	56	85	36
Whole milk with sugar	11	40	54	94	46
Citrated whole milk	9	63	40	105	63
Dried milk (1·15)	16	33	34	67	32
Unsweetened Condensed milk (1·6)—sugar	18	26	37	63	40
Breast milk	—	—	—		—
Acidified whole milk (culture).	8	13	28	41	35
Whey reconstituted from whey powder	7	37	40	77	56
	7	117	36	153	43

Results with Different Foods.

The publication of tables showing results in individual cases is contra-indicated by considerations of space, and it has, therefore, seemed best to give a simple table of averages for each type of food. This to some extent diminishes the contrasts. In considering these results the pH of milks before feeding should be considered. These averaged as follows: Breast milk, pH 6·5; cow's milk, pH 6·4; cow's milk with 20 per cent. HCl N/10, pH 5·2; lactic acid milk, pH 5·0; ideal milk, pH 6·2; dried milk (diluted 1·15), pH 6·6.

It will be seen from Tables I. and II. that with the ordinary types of feeding—viz., milk and water mixtures (half and half), dried milk, and condensed milk (in similar dilutions), the pH concentration does not vary markedly from breast milk. The acidity is not affected by small variations in fat percentage, skim milk giving the same result as whole milk. There appears to be little difficulty in obtaining a sufficient secretion of HCl to meet the need of what may be considered a suitable pH for gastric digestion in infancy, taking the acidity in the case of a healthy breast-fed infant as a standard. Secway mixtures give a low pH. The reason for this is seen in the high buffer value (Table II.). A low acidity is also obtained when soda bicarbonate or potassium citrate is added to the milk. In these cases the pH is below the optimum formulated by the authorities previously quoted, but this only occurs with these alkaline milks. The acidified milks give a definitely higher pH.

The HCl deficiency with milks of the same dilution remains fairly constant and about double that of the breast milk. Acidified whole milk gives practically the same deficit as whole sweet milk. The reason may be that the physical condition of the milk hastens digestion. It will be noted that the buffer value is given plus free fatty acids; it is obtained by adding the HCl deficit and total and combined acidity, and consequently must include free fatty acids. The acid milk gives a high figure owing to a high total and combined acidity with more free fatty acid. The figure for whey is in contrast with this and represents a large HCl deficit.

The rate at which the stomach empties varies within fairly wide limits in individual cases, but does appear to be affected rather by the physical properties of the food than by the pH concentration. Thus, where whole milk has been fed either sweet, citrated, or acidified, over 45 per cent. of the contents remain in the stomach after one hour, whereas with breast milk or dilutions of cow's milk under 40 per cent. remains.

Results in Different Conditions.

Grouping the results by the condition of the child's health in certain of the cases, the average pH obtained is shown in Table III.

TABLE III.

—	No. of exam.	Ordinary feeds.	Ac. milk.	Alk. and Secway mixtures.
Healthy	19	4·9	4·3	6·0
Enteritis	24	4·8	4·5	5·6
Dyspepsias	17	4·7	4·1	—
Bronchitis, Pyelitis, &c.	8	5·0	—	5·9

It will be seen that the variation is not great, but that in acute illness there is a slight fall in acidity such as might be expected.

Further Considerations.

As a result of careful observation of individual cases, the conclusion has been reached that the amount of gastric acidity is not of great importance. In relation to vomiting the character of the curd, and the consistency of the food mixture, together with the fat percentage, appears to be of much greater importance. Where the curd is soft and flocculent, higher fat percentages appear to be better tolerated, as in acidified milk, and as in Ideal milk given as whole milk. Rennet milk apparently gives similar results. In this connexion the work of Rogatz[7] on the peristolic function of the stomach should be remembered. On the other hand, there can be no doubt that lactic acid milk, prepared by souring with the *Bacillus bulgaricus* or similar organism, is a very valuable food in certain cases, though its value is felt to lie in its biological rather than in its chemical action. The results have been very striking in some very obstinate cases of enteritis, and have been associated with a change in the intestinal flora. This has been found to be the case only in a very definite group of cases—viz., infective enteritis—and lactic acid milk has not proved a universal panacea, but is undoubtedly a most valuable adjuvant. A very interesting study of the results on intestinal flora by the use of milk acidified by the *Streptococcus lacticus* has just been published by Alan Brown[8] and others. The results obtained are most suggestive.

Lactic Acid Milk.

Method of Preparation.—The milk has been soured with *B. bulgaricus*. Repeated subcultures in the feeding-room have been avoided owing to the dangers of contamination. The milk is sterilised in litre

TABLE IV.—TEN CASES OF ENTERITIS TREATED WITH LACTIC ACID MILK.

Case.	Age.	Condition.	Symptoms.	Food.	Stools.		Result.
					Before.	Later.	
1. U. B. . .	6 mths.	C. E.	Wasted. 1¼ lb. loss of weight in one week. D., no V.	A. S. M. and D. M. Later: A. whole milk.	—	—	Complete recovery in four weeks. Sent home on ordinary milk two weeks later.
2. P. P. . .	8 mths.	C. E.	Very wasted and feeble. D. V.	A. S. M. and D. M.	Green, alkaline, mucus and blood + + Gram + b. and cocci pr.	One month. Similar. Gram + b. now pr.; less blood and mucus.	Slow imp. Discharged in 3 weeks on dried milk and has done well.
3. L. H. . .	1 mth.	C. E.	Wasted, feeble, V. Stools green, slimy.	,,	Green, alkaline, mucus and blood + Gram + b. and cocci pr.	Three months. No marked change.	Child imp. very slowly Relapsed on going home and was sent to Babies' Hosp.
4. K. R. . .	2½ mths.	C. E.	Very wasted. D. V. Severe recurrent attacks.	,,	Acid reac. (green). Mucus and blood + Gram + b. pr.	Four months. No mucus or blood. Gram + b. pr. Reac. acid.	Slow imp. with repeated relapses. Finally well and gaining weight.
5. A. G. . .	6 wks.	C. E.	Wasted, D. V.	,,	Green, acid, mucus and blood + + Gram + b. and cocci pr.	One month. Pasty, yellow. No mucus. Acid. Cocci and Gram + b. pr.	Imp. steadily on acidified milk after no imp. on other food.
6. B. W. . .	5 mths.	C. E.	Wasting, D. V., pain.	A. S. M. and D. M. After one month of other foods. Later: A. whole milk.	Acid, green, mucus and blood + + Gram + b. and Gram + b. and cocci pr.	One month. Yellow, pasty, neutral blood present. Gram b. + and cocci pr.	Rapid and steady imp. No relapses.
7. N. C. . .	7 mths.	C. E.	Wasting, D. V., urticaria.	A. S. M. and D. M. after 14 days.	Acid, mucus and blood + Gram + b. and cocci pr.	Ten days. Alkaline. Yellow, pasty. No mucus, blood still present. Gram + b. and cocci pr.	Rapid and steady imp.
8. J. G. . .	3 mths.	C. E	Wasting, D. V.	A. S. M. after one week.	Green and loose. Acid. Mucus + +. No blood. Gram + b. and cocci pr.	One month. Alkaline, yellow, and pasty. No blood. Gram − and Gram + b. with cocci pr.	Rapid and steady imp.
9. S. F. . .	4 mths.	C. E.	Wasted, D. V., pain.	Breast milk with A. whole milk.	Green, slimy. Acid. Mucus and blood + + Gram + b. and cocci pr.	Three weeks. Alkaline, yellow, pasty. Tr. of blood. Gram + and − b. and cocci pr.	Rapid imp.
10. L. V. .	12 mths.	A. E.	Wasted and feeble, D. V.	A. milk with jelly and sponge biscuits.	No record.	Ten days: Pale and slimy. Alkaline, blood and mucus + +. Gram + b. and cocci pr. Ten days later: Loose alkaline. Little blood. Gram + b. and Gram − b. pr.	Imp. steadily.

C. E. = Chronic enteritis; A. = Acute. D. and V. = Diarrhœa and vomiting. A. S. M. and D. M. = Acidified skim milks and dextri-maltose. B. = Bacilli. Pr. = Predominate. Imp. = Improvement.

Case 3 relapsed, but it was felt that there was here a fresh infection for the house was dirty and overcrowded and enteritis was prevalent at the time.

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flasks, inoculated, and then incubated for eight hours. The curd is broken up with a fork and then passed through a sieve. It is given in suitable dilutions or as whole milk. Skim milk is frequently used where fat curds are present in the stools in large quantities, 4 oz. of top milk being removed in each pint. When sweetened, infants take this milk well. There is more difficulty with older children, with whom, moreover, it has not proved very useful.

Method of Use.—On admission it has been usual to keep the infant for a few days on the milk mixture it has been receiving at home, only modifying glaring errors in quantity or percentage composition. Subsequently ½ oz. mixtures of dried milk, or other simple mixtures have been tried before using lactic acid milk. This has made it possible to exclude those cases in which the child is suffering simply from mismanagement, or unsuitable feeding, rather than from a chronic infective condition, which is believed to be the one type really benefited by the lactic acid milk mixture. Quite half the children suffering from loss of weight, vomiting, or diarrhœa improve rapidly with the correction of their diet and hygienic conditions alone.

Details of ten cases of the type which benefits most markedly, and usually very rapidly, are given in Table IV. It is not easy in a table of this kind to bring out the impression given to the clinical observer, but no one can watch these cases and fail to be impressed with the rapid change in the character of the stools, and the general improvement in the child's health. In fact, unless an improvement is obtained within eight to ten days, the probability is that the method will not be successful. There have been two or three instances where no improvement has resulted, the child being so wasted and feeble that it was practically moribund before treatment was begun. In another type of case, where vomiting is a prominent feature, the stools improve, but the general benefit is disappointing, vomiting continues, and the child fails to gain weight. In these cases other foods, such as thickened foods, have been required subsequently. The soured milk having markedly improved the bowel conditions, the child then responds more readily to such treatment. Two cases may be given :—

CASE 1.—F. J., 3½ months. Chronic enteritis, wasted, vomiting + +. Stools green and acid, mucus + +. No blood. Gram + bacilli predominate. Acidified skim milk and dextri-maltose given. Stools improved quickly, became yellow, pasty, alkaline, with a preponderance of Gram-negative organisms. Vomiting continued. No satisfactory gain in weight. Now put on alternate feeds of lactic acid milk and thickened foods (Benger's 1 oz. to 1 pint milk). Vomiting then ceased. Satisfactory gain in weight.

CASE 2.—E. H., 3 months. Chronic enteritis. Vomiting + +. Diarrhœa from time to time. Wasted. Stools loose, green, acid. Mucus and blood +. Preponderance of Gram + bacilli and cocci. Given acidified skim milk and dextri-maltose. Stools improved quickly, became pasty with no blood. Preponderance of Gram + organisms. Vomiting continued but was less frequent. Weight unsatisfactory. Given Bengers and milk feed entirely. Good gain in weight resulted. Stools remained satisfactory.

The most difficult cases for ordinary treatment are undoubtedly those of the chronic infective type. A history of early septic infection is frequent—e.g., umbilical sepsis, "pemphigus neonatorum," or other skin rashes. The infants are very wasted, look toxic, and fail to improve steadily, although carefully fed and tended. The stools are generally greenish, slimy, and curdy. They show the most marked reaction to the benzidine test for blood. The smear preparation stained by the Gram method shows a mixed flora, in which usually the Gram-positive organisms, cocci and bacilli predominate. If the child is benefiting by lactic acid milk-feeding, the stools become pasty and smooth, only a faint reaction is given to the benzidine test, and the character of the Gram film changes becoming more negative in appearance. As soon as the child appears well enough, simple milk mixtures are gradually substituted for the lactic acid mixtures. No child has been sent home on soured milk. Acidified skim milk (hand-skimmed by removing 4 oz. of top milk) has been used in the severe cases before trying whole-milk mixtures. Dextri-maltose has been preferred to the other sugars as apparently less irritating. Quite good results have been obtained in mild cases by using skim milk and dextri-maltose without acidification, but this fails in the more severe types.

Lactic Acid Milk in Other Cases.

Infantile eczema is one of the most troublesome ailments, and not less so because it usually occurs in healthy infants. Ideal milk and dried milk give fairly good results and are certainly preferable to fresh milk mixtures, but even more promising results have been obtained from lactic acid milk in several cases, for example :—

Case S. P., aged 8 months. Weight 19 lb. Covered with eczematous rash. Whole body involved. Diet : Milk, rusks, &c. Eosinophilia (8 per cent.) present. Acidified milk, rusks, and bread and butter, prescribed with a simple calamine lotion for the skin. In three weeks the rash disappeared, and reappeared on giving two feeds daily of ordinary milk. The child was finally sent home on a dried milk mixture with some recurrence of rash.

This method of feeding has not proved beneficial for vomiting infants with fairly normal stools ; it has been tried in a number of instances quite unsuccessfully. Thickened feeds, whole milk citrated, or rennet milk have given better results.

Conclusions.

1. The infant, unless acutely ill, appears capable of secreting sufficient HCl to obtain a pH concentration corresponding fairly constantly to that given by breast milk on any milk mixture ordinarily used. This may be considered the normal pH required, and it appears doubtful whether, as far as gastric digestion is concerned, any benefit is obtained by using acid milk mixtures raising the pH to a higher concentration.

2. No benefit has been seen in cases of chronic vomiting apart from enteritis.

3. Lactic acid milk, soured biologically, has a high curative value in chronic enteritis, whether this is due (*a*) to the replacement of pathogenic by harmless organisms ; (*b*) to the greater acidity of the duodenal contents, even if existing for a brief period only, stimulating the digestive secretions, and leading to the production of a less irritant end-product with a consequent diminution of inflammatory reaction ; (*c*) to both factors taking part, must remain doubtful, but the evidence appears to favour (*c*).

4. The changes produced in milk by souring appear to render it a suitable food in infantile eczema. Possibly it would prove useful in urticarias of a severe type, but the use of soured milk in the average home is fraught with danger from pathogenic contaminations.

SUSSEX PROVIDENT SCHEME.—This scheme was affected by the industrial disturbance, but a temporary falling-off in subscriptions has been followed by remarkable recovery. During the first half of the year a total of £3462 was paid to coöperating hospitals for services rendered. This includes £1880 to the Royal Sussex County Hospital.

CANCER CAMPAIGN IN MANCHESTER.—The Manchester committee proposes further investigation into the origin and prevention of mule-spinner's cancer. Dr. C. C. Twort, who has been appointed pathologist to the committee, will carry out this work at the University, being assisted by a chemist and other specialists. The after-histories of patients treated at the Royal Infirmary and the Christie Hospital are being carefully examined. A special sub-committee has been appointed to issue information to the public on the incidence and treatment of cancer, and the Manchester Insurance Committee has sent a subscription for the furtherance of its work. From Oct. 1st onwards a series of 12 lectures on various aspects of the cancer problem will be given by medical men in connexion with a post-graduate course at the Manchester Royal Infirmary and the University.

INTRA-UTERINE INJECTION OF PURE GLYCERINE.

AN EXPERIMENTAL INQUIRY INTO THE BACTERIOLOGICAL BASIS FOR THE LOCAL TREATMENT OF PUERPERAL SEPSIS AND ALLIED CONDITIONS BY THIS MEANS.

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GLYCERINE has found many practical applications in medicine. The striking work of Remington Hobbs [1] and the noteworthy clinical results obtained by him and his co-workers,[2] from the assiduous practice during the past few years of intra-uterine injections of pure glycerine for the treatment of septic conditions of the uterus and its appendages, bid fair to constitute for it an application of the most dramatic and far-reaching importance. The beneficent action of the glycerine is attributed by Hobbs mainly to its physical action as a lymphagogue, setting up a drainage of the tissues which results in a washing away of offending bacteria from the surface and the deeper parts of the inflamed region.

We think, however, that its action goes further than this, no account being taken in this explanation of any direct action of the glycerine on the bacteria themselves. Yet a considerable independent literature exists in regard to the latter. It is the author's object in the present paper to call attention to some of this work, to give at the same time an account of a few experiments carried out on the action of glycerine on certain pathogenic types of bacteria met with in the female genito-urinary tract, and to consider to a limited extent the action of glycerine on tissue cells. It is hoped thereby to contribute to a more complete understanding of the action of glycerine in inflammatory phenomena, more particularly in connexion with this gynæcological problem.

Action of Glycerine on Bacteria.

Nutritive Properties and Stimulating Effect on Bacterial Growth.—It is well known that glycerine when incorporated in artificial culture media in proportions of about 1 per cent. can be utilised by many bacteria for their own particular needs and functions. How the glycerine is utilised depends in a special way upon the bacterial species. Thus *yeasts*, according to Duclaux,[3] burn glycerine totally, with the transitory production of oxalic acid, which in its turn is used up by the growing yeast. Another bacterial transformation of glycerine is into dioxyacetone by oxidation, established by the work of Bertrand [4] with *B. sorbose*. A number of organisms studied by Castellani [5] ferment glycerine with the production of acid and gas, notably *B. coli*, *B. columbensis*, and *B. asiaticus*. Another interesting bacterial transformation of glycerine is into acrolein, by dehydration, due to an organism found in drinking-water by Voisenet[6]; to which microbe he gave the name of *B. amaracrylus*. Again, glycerine is known to stimulate the growth of certain microbes. Nocard and Roux [7] first pointed out that heavier cultures of the tubercle bacillus were obtained in broth when glycerine was present, in proportions varying between 2 and 8 per cent.

Restraining Action on Bacterial Growth.—In stronger concentrations in culture media the glycerine is found to act as a deterrent to bacterial growth.

In order to establish the nature of this arrest of microbial development, whether antiseptic (simple inhibition of growth) or bactericidal (killing of the bacteria) experiments were performed which showed that direct contact with glycerine up to 50 per cent. failed to kill *B. coli*, the organism retaining its vitality for several days, although unable to multiply, or at least not doing so. Further, it was found that this organism supported contact even with pure glycerine for at least two hours. This indicates that the action of the glycerine is primarily an antiseptic one, and only in extreme conditions does it become disinfectant or bactericidal. Bactericidal effects, as concerns *B. coli*, only come into play when the organisms remain in contact with pure glycerine for a period somewhere beyond two hours; it is doubtful whether such conditions of concentration and time have ever been realised when glycerine is brought into contact with bacteria in the tissues, as in the intra-uterine injection technique.

D'Herelle,[8] in a study of the organisms of dysentery and typhoid fever (*B. shiga* and *B. typhosus*) reports findings of a like nature. He infers from his experiments that glycerine in strong doses inhibits the culture of ordinary bacteria, the inhibition being of a hindering nature rather than a bactericidal one.

The time that bacteria could retain their vitality in pure glycerine was then investigated and six micro-organismal types met with in the vagina were studied: *B. coli*, *B. cutis communis*, enterococcus, gonococcus, staphylococcus, and streptococcus.

Experiment.—Pure cultures of these organisms were heavily inoculated into pure glycerine, and at two-hourly intervals subcultures were made either on to agar slopes or into glucose broth. The glycerine suspensions were well agitated after each withdrawal, that the reagent might act to fullest advantage throughout the duration of the experiment. Table I. sets out the results obtained.

This experiment shows clearly that different organisms possess different degrees of vital resistance to prolonged contact with pure glycerine, some being more fragile than others.

The principle here involved has long been utilised to practical advantage by bacteriologists, although the author is unaware of any exact study, such as the above, determining these time limits—as, for instance, in the well-known use of glycerine for the purification and preservation of certain of the ultramicroscopic viruses (vaccinia, rabies, and poliomyelitis). A recent application of the same principle is C. C. Twort's [9] useful method for the isolation of *B. tuberculosis* from contaminating organisms in sputum.

The time limits of the antiseptic and the bactericidal response of the bacteria dealt with in Table I. towards pure glycerine is seen thus to be as given in Table II.

These findings show how feeble is the purely bactericidal action exerted by glycerine on bacterial cells. For practical application they emphasise how

TABLE I.

—	Growth on subculture, after contact with pure glycerine, in hours.																	
	72	60	48	40	36	24	18	15	12	10	8	6	4	2	1	½	¼	Few mins.
Enterococcus	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
B. cutis communis	−	−	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+	+
B. coli	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+
Staphylococcus	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+
Streptococcus—																		
S. hæmolyticus (strain 1)	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+
„ („ 2)	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+
S. salivarius	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+
Gonococcus	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	?	+	+

[1] Proc. Roy. Soc. Med., 1924, xvii., 73–86; B.M.J., 1925, p. 1172.
[2] Phillips, H. J.: Proc. Roy. Soc. Med., 1926, xix., 26–31.
[3] Encyclopédie Chim., 1883, ix., 220.
[4] Thèse Doct. Sc., Paris, 1904.
[5] J.A.M.A., 1926, lxxxvi., 524.
[6] C.R. Acad. Sciences, 1914, clviii., 195 and 734.
[7] See Bezançon: Précis de Microbiologie Clinique, Paris, 1920, p. 532.
[8] Le Bactériophage, Paris, 1921, p. 39.
[9] THE LANCET, 1922, ii., 1221.

extended is the antiseptic, and how limited the bactericidal range of its action.

Of special interest is the noteworthy fact about the power of glycerine to deal with the streptococcus—the organism whose proliferation and activity in the uterus and the lacerated vagina it is above all essential to curb in puerperal infections. Next to the gonococcus it is the most fragile of the organisms studied in vital resistance to contact with glycerine. It is a comparatively early victim to the bactericidal effects of the glycerine, but long before that stage is reached the antiseptic powers of the glycerine are at work restraining growth. This latter action is practically the only one available in the time interval available when concentrated glycerine is injected into the uterus for the reduction of inflammation. To such a degree, then, it is possible to affirm that glycerine acts as an antiseptic when used as intra-uterine injections for arresting secondary hæmorrhage in the puerperium, and the clearing up of inflammatory discharges from that viscus.

TABLE II.

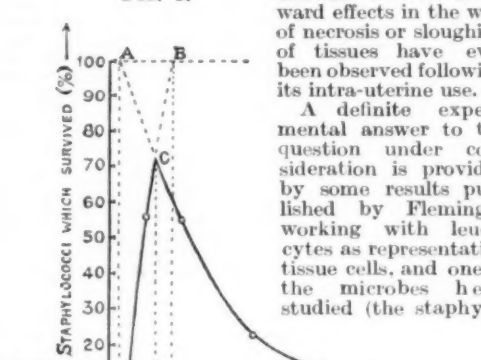
—	Glycerine contact to elicit—	
	Antiseptic response.	Bactericidal response.
Enterococcus	Up to 48 hours	Beyond 60 hours
B. cutis communis ..	,, 15 ,,	,, 18 ,,
B. coli	,, 12 ,,	,, 15 ,,
Staphylococcus	,, 12 ,,	,, 15 ,,
Streptococcus	,, 6 ,,	,, 8 ,,
Gonococcus	,, ¼ an hour	,, 1 hour

Action of Glycerine on Tissue Cells.

The problem which now arises for consideration is the degree of toxicity of glycerine for tissue cells in relation to its toxicity for bacteria; whether there is a sufficient difference between these two toxicities in favour of the tissue cells to warrant the glycerine being pushed to its extreme degree as an antiseptic and bactericidal agent, as is obviously attempted when pure glycerine is injected into the uterine cavity.

The mildly irritant effects of glycerine when applied to surface epithelium—due to its abstraction of fluid from the cells—are well known. But no untoward effects in the way of necrosis or sloughing of tissues have ever been observed following its intra-uterine use.

FIG. 1.

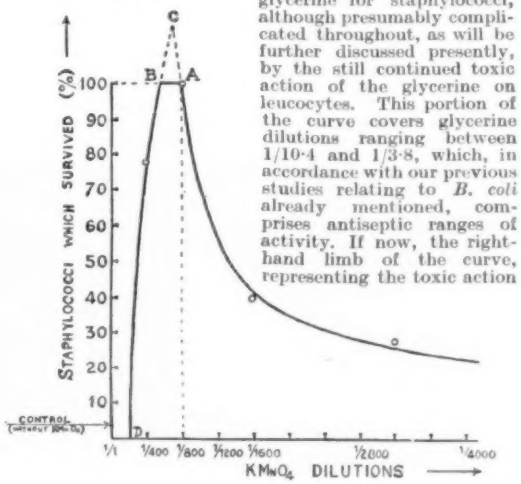


A definite experimental answer to the question under consideration is provided by some results published by Fleming,[10] working with leucocytes as representative tissue cells, and one of the microbes here studied (the staphylococcus). This author cultivated the staphylococcus in "slide cells" containing defibrinated blood and different strengths of glycerine, and after incubation at 37° C. for one, two, or more days enumerated the number of colonies which developed. In Fig. 1 are shown the series of readings obtained by him plotted as a curve, with dilution of glycerine as abscissæ and percentage of microbes which survived as ordinates.

[10] Proc. Roy. Soc., 1924, B 96, 171–180.

This curve, when read from right to left, is seen to begin as a horizontal line corresponding to glycerine concentrations too feeble to exert any influence either upon leucocytes or bacteria (the "indifferent zone" of Fleming); it then slowly ascends towards the left, portraying the toxic effect of increasing glycerine concentrations on leucocytes; here the glycerine is primarily attacking leucocytes, interfering with their bactericidal power, and allowing the implanted staphylococci to grow out. The curve next passes by a maximum,[11] in or about the glycerine dilution of 1/10·4, after which it rapidly descends. This rapid descent on the left is primarily an expression of the toxicity of glycerine for staphylococci, although presumably complicated throughout, as will be further discussed presently, by the still continued toxic action of the glycerine on leucocytes. This portion of the curve covers glycerine dilutions ranging between 1/10·4 and 1/3·8, which, in accordance with our previous studies relating to *B. coli* already mentioned, comprises antiseptic ranges of activity. If now, the right-hand limb of the curve, representing the toxic action of the glycerine on leucocytes be continued upwards to meet the 100 per cent., or total implant, line, as is indicated by the portion C A in the diagram, we obtain a point A which theoretically should represent the dilution of glycerine at which the activity of leucocytes would be so completely eliminated that all the staphylococci implanted would grow out, were it not for the antiseptic action, already begun, of the glycerine on the bacteria themselves.

FIG. 2.



It will be remarked in passing that the dilution at which antiseptic action begins is presumably given by the point B, obtained by prolonging upwards the left limb of the curve until it meets the total implant line; at this dilution all the bacteria implanted would grow out were it not for the bactericidal action of the leucocytes, a mechanism which as yet is far from being totally paralysed.

Now, on this reasoning and interpretation of Fleming's experiment, it will be evident that the answer to the question put forward at the commencement of this section—namely, the relative toxicity of glycerine for tissue cells and for bacteria—will be given by a consideration of the position of the point A in relation to the point D, where the curve of action meets the zero line. At D no staphylococci can survive; at A no leucocytes, or the bactericidal power of the blood which they represent, can survive. The point A is found thus by interpolation to correspond to a glycerine dilution of approximately 1/2·4 (or a glycerine concentration of 41·7 per cent.), the point D to a dilution of approximately 1/3·8 (or a glycerine concentration of 26·3 per cent.). This means, then, that the leucocytes, as typical tissue cells, when pushed to it, can support a much higher concentration of glycerine (actually approximately 15 per cent. more) than can staphylococci; and bacteriologically these latter are usually considered to be a fairly resistant type of micro-organism. This conclusion is reached in spite of the fact that the attack on leucocytes by glycerine begins

[11] This maximum on the curve of activity, it will be evident, is not a true maximum in the mathematical sense of being a balance point between two opposing forces. It would appear, as indicated, to be simply the point of intersection of two curved lines; and if it is to be defined at all it might be called the *maximum freedom from restraint point of the bacteria* under the conditions of the experiment.

earlier, at the point marked E on the diagram, than does the attack on staphylococci, at the point B.

Thus it is seen that it is the end-points A and D which ultimately count in judging the value of an antiseptic by this particular experimental method; the author is of opinion that this is an aspect of the question which has hitherto not received adequate attention. Finally, let us consider briefly, for the sake of comparison, the story which potassium permanganate yields when interpreted graphically in like fashion.

Fig. 2 gives the curve for $KMnO_4$ which follows from the experimental data furnished by Fleming. The curve in this case rises to the 100 per cent. line, so that the point A, instead of being imaginary as in the case of glycerine (Fig. 1), is real. Next the curve appears to pass through a flat region, A B—covering $KMnO_4$ dilutions which would allow all the staphylococci implanted to grow out—to fall from B to the zero at D.

This zone (A B), which it remains for future investigation to confirm experimentally, is a new type of "indifferent zone," and to distinguish it from that described by Fleming it might be called a *bacterial indifferent zone*, the indifferent zone of that author being a *leucocytic indifferent zone*.[12]

Here, also, the point B is real, although there is some little difficulty in fixing it exactly from the data available, no observations having been recorded for antiseptic dilutions lower than 1/400. Still, in view of the reading recorded for 1/400 there is good reason to suppose that the representation of the left limb of the curve is approximately that portrayed. In any case, and this is the important feature of the curve, it shows that the attack on leucocytes is over and finished with (the point A) long before even the antiseptic action has been begun (the point B), and still longer before the antiseptic action can be complete (the point D).

This establishes the fact that potassium permanganate possesses a markedly greater paralysing effect on the tissue cells of blood than on a typically resistant microbe, like the staphylococcus. As an antiseptic, then, it is certain to do more harm than good, unless the organism to be combated is one much more fragile than the staphylococcus. And this analysis of the activity of potassium permanganate merely serves to bring out in greater relief the vast superiority of glycerine for antiseptic and surgical use, when dealing with an organism like the staphylococcus.

General Conclusion and Summary.

That the bacteriological basis for the treatment of puerperal sepsis and allied conditions by the intra-uterine use of glycerine, as conceived by Hobbs, is well founded is borne out by an analysis of the behaviour of tissue cells and bacteria to this reagent.

In a study of the former—from data published by Fleming, based on an ingenious application of the "slide cell" technique of Wright—we have been able to show that glycerine is an ideal antiseptic in the sense of being less fundamentally toxic for leucocytes, as representative tissue cells, than for a typically resistant bacteria like the staphylococcus. Incidentally, in this connexion, we have indicated how it is possible by the use of a graphic method of presentation of slide cell results to define more completely the theoretical terms of an antiseptic. As examples of two fundamentally different types of cyto-bacterial activity curves, those for glycerine and potassium permanganate are figured.

A new antiseptic characteristic is indicated, the *bacterial indifferent zone of cyto-bacterial activity*, which—being present in the case of antiseptics possessing greater toxicity for tissue cells than for bacteria, and absent in the case of antiseptics possessing greater toxicity for bacteria than for tissue cells—affords a criterion for the selection of useful antiseptics and the rejection of those likely to do more harm than good.

[12] These zones distinguish themselves from each other in that for dilutions of the antiseptic corresponding to the "bacterial indifferent zone" the bacteria are indifferent to the presence of the antiseptic as concerns toxic effects; while, in the "leucocytic indifferent zone," it is the leucocytes which show indifference to the presence of the antiseptic. Again, in the matter of bacterial growth, in the "leucocytic indifferent zone" the leucocytes are able to inhibit bacterial growth to the extent of the control without glycerine; while in the "bacterial indifferent zone" the bactericidal function of leucocytes being lost, they are powerless to restrain growth, and the bacteria all grow out, until the antiseptic dilution is reached at which toxicity for bacteria comes into play.

In a study of the direct action of glycerine on various bacterial types met with in the genito-urinary tract it is established that pure glycerine is but feebly bactericidal in comparison with its markedly antiseptic character. The time limits of its bactericidal and of its antiseptic responses to a number of bacteria are indicated. The streptococcus is seen to succumb comparatively early to the bactericidal action of glycerine.

The new facts brought to light make glycerine one of the most interesting and ideal antiseptics, and indicate for it a sphere of even greater usefulness in the treatment of inflammatory conditions.

THE ACTION OF LIGHT ON COD-LIVER OIL.

BY P. R. PEACOCK, M.B., B.S. LOND.,
VAUGHAN MORGAN SCHOLAR AND MARGARET BUTCHER SCHOLAR, MIDDLESEX HOSPITAL.

IN January, 1925, during the examination of many oils and fats under ultra-violet illumination, it was noticed that cod-liver oil was very brightly fluorescent. The sample of oil stood, in a 100 c.cm. round glass flask plugged with cotton-wool, on the laboratory bench, untouched from January to June of last year, when I again had occasion to examine the fluorescence of the oil. The second examination showed that the oil had completely lost its fluorescence, though by ordinary light it appeared unchanged.

The following explanations of this phenomenon seemed to be possible: (1) That the oil had reacted with atmospheric gases leading to oxidation. (2) That the effect was due to variations in temperature. (3) That the effect was due to absorption by the oil of heat, light, or ultra-violet radiations.

Confirmatory Experiments.

June 3rd, 1925: Two samples of very brightly fluorescent cod-liver oil were sealed in soft glass tubing of 6 mm. bore and 1 mm. wall thickness. One tube was covered with rubber tubing to exclude light and ultra-violet rays, and both tubes were then set side by side in the sun's rays. Daily examination revealed complete loss of fluorescence in the uncovered sample on the fifth day. The control was still brightly fluorescent.

June 12th: Four tubes similar to those used in previous experiment were half filled with fluorescent cod-liver oil. Two were sealed in air, two in vacuo (Sprengel pump). One tube containing air and one vacuum tube were covered with thin black paper to exclude light and the four tubes were then set on the hospital roof for irradiation. Both uncovered tubes had lost their fluorescence after approximately ten hours' sunshine, the controls remaining unaffected.

The above experiments suggested that the effect was not a simple oxidation due to contact with the air or to the presence of dissolved oxygen in the oil. The conditions as regards temperature were the same for the controls, so that this factor is eliminated. We are left with the possibility of the effect being due to light or "near" ultra-violet rays (up to 3100 A.U.), the "far" ultra-violet being excluded by the glass.

During the last year this phenomenon of the destruction of fluorescence in cod-liver oil by exposure to light has been repeated so often and under such varying conditions that it is probably a constant effect. For the sake of brevity, the term "delumination" was coined to signify the loss of fluorescence described above. In addition to sunlight, "delumination" has been produced by the tungsten-cored carbon arc, the mercury-vapour lamp, and a fullolite gas-filled lamp. The times required range from ten hours in brilliant summer sunshine to five days under the metal filament lamp at a distance of 5 cm.

It appears that a certain critical intensity of light is required to upset the equilibrium of the oil and initiate the process of "delumination," for, in the winter, the effect is not observed in samples of oil which have been exposed for several months to daylight. Deluminated oil, stored for many months

in the dark, recovers some of its fluorescence, but, within the period of these experiments, none has regained its original brilliance.

Vitamin Content.

One of the first questions that suggests itself is: "Has the phenomenon of delumination any relation to the vitamin content of the oil?"

Vitamin A: The presence of this vitamin is easily tested, thanks to the work of Dr. O. Rosenheim and Prof. J. C. Drummond,[1] whose colour reaction for vitamin A corresponds accurately with the results of animal tests. The addition of ½ c.cm. of arsenic chloride to a drop of cod-liver oil in a small tube gives, in the presence of vitamin A, a blue colour which fades in a few minutes on standing. Samples of fluorescent and of deluminated oil were tested by this means; normal cod-liver oil gave the reaction strongly, deluminated oil gave a completely negative reaction. The effect has been repeatedly demonstrated and can be regarded as constant for deluminated oil.

It was necessary to investigate in detail the relationship between the delumination of cod-liver oil and the destruction of its vitamin-A content, and a description of the methods employed to solve this problem may be given at this point.

The oil used was a well-known proprietary brand of Newfoundland cod-liver oil, which is very constant as regards specific gravity, colour, odour, fluorescence, absorption spectrum, and vitamin-A reaction, and is tested biologically for fat soluble vitamins before being supplied to the public. This oil is supplied in brown glass bottles, which incidentally protect it from the effects of light.

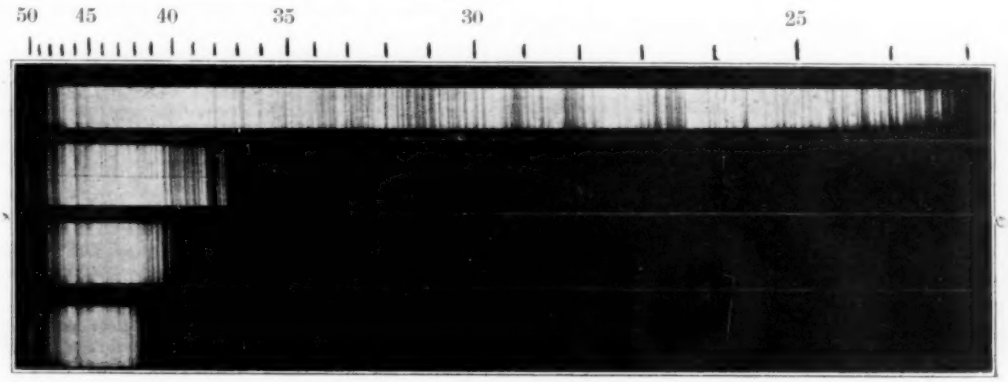
The oil to be examined was first drawn into soft glass tubing of 7 mm. bore and 0·5 mm. wall thickness, which was then sealed. The tube of oil was then placed vertically in front of the slit of a quartz spectrograph (A. Hilger, size C) and the absorption spectrum of the oil was photographed. The source of light used was a condensed iron spark giving a very uniform distribution of closely packed lines extending far into the ultra-violet region. The absorption of the glass may be neglected as it is less than that of the contained oil (see figure). The tube was then unsealed and the oil, after being re-tested for vitamin A and found to be strongly positive, was drawn into fine capillary glass tubes of 1 to 2 mm. bore and less than ½ mm. wall thickness. These tubes were sealed and set in a row in the sunlight.

Frequent tests were made for vitamin A until the reaction was faintly positive, when each tube was tested repeatedly until a negative reaction was obtained, the tube being then put in the dark to prevent further delumination of the oil. Sufficient oil was thus obtained for absorption spectra to be taken under the same conditions as for normal cod-liver oil, as described above.

Comparison of the absorption spectra shows at once that the destruction of vitamin A corresponds with an increase in the transmission spectrum, the limit for normal cod-liver oil being 4100 A.U., that for the oil in which vitamin A has just been destroyed being 3900 A.U. Both samples of oil are still fluorescent, but the irradiated sample is definitely less brilliant than the control sample of normal oil.

From these experiments it is evident that "delumination" and destruction of vitamin A, though parallel, are not identical phenomena, as further delumination can be obtained after destruction of vitamin A is complete. In further support of this view is the fact that fully deluminated oil after nearly a year in darkness recovers much of its fluorescence but still fails to give the colour test for vitamin A. This latter observation shows that we are dealing with a complex reaction which is apparently partly reversible.

At a meeting of the Physiological Society held at Cambridge on June 5th a demonstration of the action of light on cod-liver oil was given by the writer, in collaboration with Dr. S. Wright,[2] when the results of preliminary animal experiments were put before the meeting.



I. Emission spectrum of condensed iron spark.
II. Absorption spectrum of deluminated cod-liver oil.
III. Absorption spectrum of cod-liver oil in which the vitamin A has been destroyed by sunlight.
IV. Absorption spectrum of normal cod-liver oil.

Rats fed on a basal diet deficient in vitamin A were protected from xerophthalmia and continued to put on weight when 2 per cent. normal cod-liver oil was added to the diet.

Similar animals on the same basal diet, to which 2 per cent. deluminated oil was added in place of the normal oil, developed marked xerophthalmia and began to lose weight.

Substitution of normal for deluminated oil in the diet caused a rapid recovery in these animals.

These results are in complete accord with the foregoing experiments and appear to confirm the destruction of vitamin A in cod-liver oil by exposure to sunlight.

Vitamin D: By the courtesy of Prof. C. J. Martin, of the Lister Institute, I was able to examine under the ultra-violet rays samples of cod-liver oil of known degrees of antirachitic potency. There seemed to be no association between the fluorescence and the antirachitic value of the various oils and extracts. Samples of inactive cotton-seed oil showed no difference from similar oil which had been rendered actively antirachitic by exposure to ultra-violet rays. It was thought from these observations that there was no evidence to suggest destruction of the antirachitic vitamin in cod-liver oil by sunlight.

Summary.

Exposure of normal cod-liver oil to any source of white light of sufficient intensity results in the following changes: (1) The normal bright golden fluorescence of the oil progressively disappears, this effect being termed "delumination." (2) Before full "delumination" occurs the oil fails to give the arsenic chloride test for vitamin A. (3) Fully "deluminated" oil, when kept for some months in the dark, slowly regains much of its fluorescence, but the vitamin A appears to be permanently destroyed. (4) There is

[1] O. Rosenheim and J. C. Drummond: Biochemical Journal, 1925, vol. xix., No. 5.

[2] P. R. Peacock and S. Wright: Proceedings of the Physiological Society, June 5th, 1926, p. 36.

a change in the absorption spectrum corresponding with change in the fluorescence of the oil. As "delumination" proceeds, so the transmission spectrum extends into the ultra-violet region; as fluorescence returns there is a proportionate return of the absorption spectrum.

This paper has a double object; first, to emphasise the fact that light is a variable factor which must be taken into account in all quantitative experiments concerning the growth-promoting properties of cod-liver oil and the manner in which such oil is stored; secondly, to call attention to the unusual nature of the complex reaction of cod-liver oil to light, a reaction which is only partly reversible.

Clinical and Laboratory Notes.

TONIC SPASM OF THE EYES IN CONJUGATE DEVIATION.

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THE emotional instability of some cases showing disorders of the basal ganglia has led frequently to their being regarded as hysterical, and this view has very naturally been taken of the symptom I am about to describe. This is the spasmodic conjugate deviation of the eyes upwards, usually to one side, accompanied by subjective distress and acute depressions.

Three Cases.

The first case in which this symptom was noticed was one of progressive lenticular degeneration; the patient had been recommended for admission as hysterical, but when seen was recognised to be suffering from an organic disease of the Parkinson type. She was childish and emotional, subject to spasmodic laughing and crying, and began to complain that her "eyes got fixed,' this being associated with great distress. At first this occurred rarely and lasted for only a few moments, but it has become more frequent and the attacks will last for any time up to about an hour. She can always move the eyes voluntarily, but this requires an effort, and they return when the effort is relaxed to the fixed position of conjugate deviation upwards and to the left. There is no nystagmus at any time in this patient and she has never had diplopia. Visual fields are normal.

The second case was sent from an infirmary, where she had been taken on account of threats of suicide, as she was depressed about the 'fixing' of her eyes and thought this made her conspicuous. This had been her first symptom, beginning about a year ago, and she had noticed that emotional stress, such as anxiety about her husband, brought on the attacks. In these her eyes move up and to the left, become fixed, can be brought down by volitional effort, but soon return to the position of spasm. There is nystagmus on looking to the right, and she has had diplopia when reading, possibly due to refractive error and neglect to wear her glasses. Visual fields are normal. Later she developed spasmodic torticollis, independent of the eye symptom, and weakness and tremor of the right arm of the Parkinson type. She denies having ever seen anyone previously with similar symptoms.

The third case was a young man who complained that his eyes turned up and became fixed on Mondays; he was a bank clerk. Further investigation showed ankle-clonus on one side, and a history of encephalitis lethargica was elicited, with transient diplopia. The eye symptom was associated with depression.

Comment.

Since seeing these cases reference to the literature has discovered a paper by Marinesco and Radovici[1] in which the conjugate deviation of the head and eyes in paroxysmal hypertonic attacks is described in three cases of post-encephalitic Parkinsonism; they suggest that these are due to some factor in the basal ganglia which is either not functioning normally or is not controlled normally by the cortex. In our cases the deviation of the eyes occurs alone, the head remaining in the flexed Parkinson posture in one case, while in the other a spasmodic torticollis occurs, but at separate times and under different circumstances from the eye symptom. Since the symptom is of a kind likely to be disregarded or considered hysterical, it seems worth while to draw attention to it as being, in some cases at least, an early manifestation of a serious and progressive organic disease. Its constant association with spasmodic attacks of depression or weeping affords further evidence of the close relation between the basal ganglia and the emotions, and tempts one to speculate as to a possible organic basis through which the emotions may produce physical manifestations in hysteria.

I wish to thank Dr. E. Mapother, the medical superintendent of the Maudsley Hospital, for his permission to refer to these cases, who have been in-patients of the hospital. He also informs me that he has met with a similar case in his practice where the same eye symptoms were associated with choreiform movements in a post-encephalitic case.

[1] Revue Neurologique, February, 1926.

NOTES ON AN OUTBREAK OF INFANTILE DIARRHŒA ASSOCIATED WITH A PARASITIC FUNGUS.

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FOR the past two years we have been meeting with many cases of diarrhœa in young children, which have caused an abnormal death-rate from that disease. The symptoms are the usual ones of many stools—blood being frequently present, quick loss of weight, and vomiting. Two types appeared to exist—a very acute type and a four-week type. From time to time one of us (H. A. C.) examined the stools and sera of cases for members of the enteric, dysentery, and other groups of organisms associated with the incidence of diarrhœa among young children. It was next observed that children who suffered from stomatitis appeared also at a later period to suffer from diarrhœa. As the diarrhœa remained prevalent and the death-rate unduly high it was definitely decided to attack the disease more systematically.

One of us (E. T.) was concerned with the clinical and hygienic aspects of the investigation and stools were obtained from acutely ill children for bacteriological examinations, and in one instance also serum from a convalescent was fully investigated. It had been noted that if the children were removed to hospital on the first or second day, and inter alia careful attention given to the toilet of the mouth speedy recovery took place. The bacteriological examination, a summary of which is appended, would appear to incriminate *Oïdium albicans* as the causal organism, for whereas it appears in debilitated adults as a more or less harmless parasite, in children it without doubt produces diarrhœa. Acting on this possibility lectures were instituted to be given by the health visitors on cleanliness of the mouth and the rigid treatment of all lesions due to thrush and the look-out to be kept for such conditions. This has effected a remarkable improvement in the returns; it would therefore appear very advisable in all cases of diarrhœa amongst young children to examine with care the mouth for thrush or ulcerative stomatitis and to treat if necessary.

Ten stools were examined microscopically and bacteriologically; of these seven showed mycelium and spores of *Oïdium albicans*, no member of the enteric or dysentery group was found, and the stools had no other micro-organismal factor in common other than the oïdium. The serum of a convalescent patient was tried for agglutinins against a large range of members of the typhoid-colon group. No such agglutinins were demonstrated.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT NOTTINGHAM.

(*Continued from p. 289.*)

SECTION OF ANÆSTHETICS.

WEDNESDAY, JULY 21ST.

THE first session of this Section was opened by the President, Dr. SAMUEL JOHNSTON (Toronto), who reviewed the benefits of anæsthesia and discussed its future. It was essential, he said, that anæsthetists should be well grounded in basic sciences such as physics, chemistry, and pharmacology, and, where practicable, technique should be learnt on animals. The ideal ought to be that every qualified man should be able to give a safe, efficient, and pleasant anæsthe-ia in cases of labour and minor surgery. A certain number of more highly qualified anæsthetists should be available for the hospital work of the smaller towns, and these should hold positions comparable to those of staff anæsthetists in the teaching hospitals. The three groups of anæsthetists all had their special functions, but on the last named particularly devolved the onus of developing the art. Some idea of the progress achieved in 25 years could be gained by considering the growth of the anæsthesia department of the Toronto General Hospital, which now consisted of a chief and eight assistants, all of them specialists. It was not too much to hope that in the near future a chair of anæsthesia would be established in every university where medicine is taught. There was no doubt that the routine use of the uniform anæsthesia record charts issued by the International Anæsthesia Research Society would prevent a large number of fatalities. These charts require the following essentials: (1) evaluation of risk and determination of pre-operative treatment; (2) five-minute blood-pressure records to enable anti-shock treatment to be instituted promptly; and (3) determination of post-operative treatment. The Society was at present concentrating on the production of a more elaborate teaching anæsthetic chart.

Development in anæsthesia was proceeding apace, as was evident from reports of new general and local anæsthetics. A uniform standard of purity was very desirable, and a committee of investigation had already been formed by the British Medical Research Council and the Anæsthetic Section of the Royal Society of Medicine. New inventions must be made public in strict accordance with medical ethics, and the royalties accruing should be devoted to further research. In all these efforts the patient's point of view must remain paramount, and anæsthetists would do well to appropriate the motto of the Pacific Coast Association, "It is God-like to relieve pain," and that of the Canadian Society, "We safeguard those who sleep."

Dr. WESLEY BOURNE (Montreal) read a paper on the Effect of Some Impurities in Ether on Respiration and Blood Pressure. He showed lantern slides which demonstrated that acetaldehyde, ether peroxide, and ethyl sulphide all caused a lowered blood pressure and respiratory embarrassment in a dilution of 1 per cent. in ether. Ethyl mercaptan in an infinitesimal proportion caused a most nauseating odour, but all the ketones tried—acetone, dimethyl ketone, and methyl ethyl ketone—appeared to exert no deleterious influence even up to a concentration of 5 per cent.

Dr. R. E. APPERLY (London) said that in spite of Dr. Bourne's investigations, he thought that the minute traces of aldehydes in ether had a prejudicial effect upon recovery.

Dr. H. M. COHEN (Manchester) read a paper on journals dealing with anæsthesia, from the publication of Morton's Circular in 1847 down to the present day, and emphasised their value to practitioners and to research.

Dr. C. W. MOOTS (Toledo, Ohio) read a paper on Coöperation with the Surgeons, in which he dealt first with the importance of post-graduate teaching in anæsthetics. It was very desirable, he said, that surgeons should understand the theory of anæsthesia so as to be able to coöperate with anæsthetists by the use of a technique minimising shock and enabling the smallest possible dose of anæsthetic to be employed. He emphasised the importance of keeping blood-pressure charts, and said that in his opinion the best index of a patient's condition was the pressure ratio —i.e., the fraction: $\frac{\text{pulse pressure}}{\text{diastolic pressure}}$. This should remain between 70 and 30 per cent., otherwise the operative risk was extremely bad.

Dr. F. H. MCMECHAN (Ohio) laid stress on the necessity for preventing needless deaths not only on the operating table, but also during the 72 hours that followed operation.

The second session was opened by Dr. MCMECHAN with a paper on

The Newer Gaseous Anæsthetics.

It had been remarked, he said, that an ideal anæsthetic gas should be one which has a sufficient solubility in water to be carried to the central nervous system, which has so high a solubility in lipoids as to lead to its differential accumulation there, and which will leave the body rapidly and unchanged. Nitrous oxide had been used for years as an anæsthetic, but its great drawback was that practically the whole of the nitrogen in the body must be displaced. This was attempted clinically by secondary saturation. Recent work on theories of anæsthesia had disclosed electrical changes in anæsthetised animals, but these were of theoretical rather than practical importance. The metabolic concept of anæsthesia, however, was of great interest, as it supposed that diminished oxidation in lipoid tissue occurs, and that it can be brought about either by oxygen restriction or by partial saturation with lipoid-soluble anæsthetics, such as chloroform and ether. These two factors in their turn involved changes in the acid-base equilibrium. It was the duty of an anæsthetist to render these changes as negligible as possible. When using any gas anæsthetic it was absolutely essential that it should be perfectly pure. The most minute trace of other substances might lead to considerable danger. The relative potency and toxicity of gas anæsthetics might be expressed as follows, ethylene being taken as unity: Nitrous oxide, 0 85; ethylene, 1; acetylene, 1 5; propylene, 2 25; butylene, 4 5; amylene, 15. The oxygen-content for an anæsthetic mixture also rose in the same order, being about 10 per cent. in the case of nitrous oxide, 12–15 per cent. for ethylene, and 30 per cent. for acetylene. With propylene, an inert gas such as nitrogen could be used to dilute the mixture and render it non-inflammable, but this mixture was liable to cause circulatory collapse some hours after administration. The methane series of gases did not show much promise as anæsthetics. The rapid saturation of the body and equally rapid elimination of the gas anæsthetics constituted their chief advantage. It had been shown that if gas anæsthetics could be given with oxygen in a pressure chamber under one-sixth of an added atmosphere, the resulting anæsthesia would not only be better but safer than at atmospheric pressure. It had also been demonstrated that the gas anæsthetics did not enter into any combination with hæmoglobin, and had less effect upon the hydrogen-ion concentration of the blood and upon carbohydrate metabolism than have ether, chloroform, and ethyl chloride. They had less effect on renal function. Some observers believed that the gas anæsthetics increased oozing from raw surfaces, but it was doubtful whether this action was perceptible. On the other hand, they did increase, rather than decrease, uterine contractions, thus behaving in the opposite way to chloroform and ether. The blood pressure was maintained far longer than with the older anæsthetics, while their action on the myocardium appeared to be negligible.

Dr. E. I. MCKESSON (Toledo) elaborated Dr. McMechan's paper by pointing out the differences in anæsthetic signs between nitrous oxide-oxygen and ethylene-oxygen, drawing the conclusion that ethylene was more depressing and powerful generally than nitrous oxide.

Dr. J. D. GOLDMAN pointed out that with nitrous oxide oxygen deficiency was inevitable; with ethylene it could sometimes be avoided, but with acetylene the oxygen content of arterial blood could always be kept within normal limits. It was essential, however, that all traces of acetone should be removed from the gas.

Dr. S. R. WILSON pointed out that deep hypnosis, trance, and hibernation presented similar phenomena to anæsthesia, and suggested that it might be of value to study these conditions more closely.

THURSDAY, JULY 22ND.

At the third session Dr. F. W. PRICE (London) opened a discussion on

Anæsthesia in Relation to Cardiovascular Affections.

He began by remarking that an opinion on the risk of administering an anæsthetic to a subject with some cardiovascular affection was usually given with some difficulty. Speaking generally, it was surprising how well patients with cardiovascular affections took anæsthetics, the exceptions being usually those with chronic myocardial disease. The fundamental question was whether the impaired heart and other parts of the cardiovascular system were capable of withstanding the added strain of an operation and anæsthetic. In the majority of cases only palpation and auscultation were required to arrive at a decision; sometimes the use of a sphygmograph was helpful, but only occasionally was it necessary to employ a clinical polygraph or the electrocardiograph. The rate and rhythm of the heart should always be determined at the cardiac apex because the rate of the radial pulse did not necessarily represent the ventricular rate, and in order to determine the type of irregularity. It was often difficult to decide whether tachycardia and bradycardia were physiological or pathological. An increase of more than 15 beats per minute when the patient assumed an upright posture was suggestive of vasomotor instability. The increase in rate from physical exertion varied greatly, but help might be gained from the presence or absence of accompanying subjective symptoms of cardiac distress. The possibilities of atony of the heart muscle from lack of physical exercise and poisoning without structural damage must also be borne in mind. The time elapsing before the cardiac rate returned to normal after physical exertion was of greater significance than the degree of increase induced by the exertion. Dr. Price then described the characteristics of various forms of irregularity of the heart's action, and discussed their significance in prognosis. Attention, he said, should be directed to examining the walls of arteries other than the radial before excluding disease, and the size of the heart should be carefully estimated. To decide on the importance of a murmur, the patient should always be examined standing up and lying down, before and after gentle exercise, and during the various phases of respiration. It should be remembered that a valvular defect was a mechanical impediment to the heart muscle in its work and that there were usually coincident changes in the myocardium, aorta, and coronary arteries. In valvular lesions due to previous acute endocarditis, the prognosis was better than when primary chronic endocarditis or syphilis was the cause. Sudden death was most likely to occur in fatty and fibroid degeneration of the myocardium, in angina pectoris, in aortic incompetence, and in the sudden closure of the lumen of a coronary artery. It was of the greatest importance to ascertain whether a lesion had affected the myocardium, and a guide to this was the heart's response to effort—in other words, the amount of physical exertion which did not cause symptoms of cardiac distress. It was of value to inquire whether the patient's normal standard had decreased and, if so, to what extent. (Temporary causes such as anæmia and mental strain must be excluded.) The usual symptoms of distress were breathlessness, palpitation, fatigue, and precordial pain. The last of these might not occur for some hours. The pain of angina pectoris was felt most commonly in the retrosternal region, and there might be cerebral symptoms, including giddiness, fainting attacks, and seizures resembling petit mal, and the Adams-Stokes's syndrome. Fatalities had occurred during anæsthesia owing to inadequate treatment of the heart condition beforehand—the condition could often be vastly improved by giving digitalis by mouth, or, in urgent cases, by the intravenous injection of strophanthin. In choosing an anæsthetic it was important to remember that the symptoms of cardiac failure in mitral disease were mainly respiratory, whilst the symptoms in aortic disease and in fatty degeneration of the myocardium are those of systemic anæmia; here the chief danger was of syncope and anything that lowered the blood pressure should be avoided. In arterial disease, aneurysm, and angina pectoris, on the other hand, the blood pressure should not be raised. Chloroform should be avoided in heart-block, and intermittent and very light anæsthesia was always undesirable.

Dr. J. BLOMFIELD said that it was remarkable how few fatalities occurred during anæsthesia in patients with cardiac lesions. There was hardly any cardiac disease so advanced that it would not permit some form of anæsthesia or analgesia to be employed for an emergency operation. In severe cases it was essential that the patient should retain the position for easiest breathing, and there should be no asphyxia. Anæsthetics causing least muscular spasm should be employed, an unobstructed airway should be maintained, and oxygen should be given continuously. A useful rough test was the length of time a patient could hold a deep inspiration. If this was under 30 seconds it would probably be dangerous to give a general anæsthetic. Myocardial degeneration without valvular lesions was the bugbear of anæsthetists, and in doubtful cases a cardiologist should be consulted.

Dr. E. VON DER PORTEN said that in his opinion patients with cardiovascular lesions should be kept lightly anæsthetised and a preliminary injection of morphia and atropine should be given.

Dr. A. L. FLEMMING (Bristol) emphasised the importance of a quiet and unhurried induction period.

Dr. MARY BOTSFORD (California) said that a consideration of the patient's previous history was important. She thought that psychic shock should be avoided and that nitrous oxide-oxygen anæsthesia with preliminary morphia and atropine medication was indicated.

Lady BERRY (London) laid stress upon the desirability of preliminary rest and administration of digitalis. Morphia she considered unsatisfactory, and she usually employed atropine alone, followed by light ether anæsthesia. Patients should be talked to as they were going under.

Dr. CRIGHTON BRAMWELL (Manchester) said that except in aortic disease, Stokes-Adams's syndrome, and fatty or fibroid degeneration of the myocardium, syncope was generally due to vasomotor instability. Bradycardia apart from heart-block was favourable, but pulsus alternans without tachycardia was always of grave import.

Dr. H. W. FEATHERSTONE (Birmingham) said that extrasystoles frequently disappeared under anæsthesia. He disliked using chloroform and spinal anæsthesia as he found that the systolic blood pressure tended to fall more than the diastolic.

Dr. H. P. FAIRLIE (Glasgow) said that it was in the post-operative stage that collapse frequently occurred in cardiac cases.

At the fourth session Dr. E. I. MCKESSON gave a lecture on

Some Physical Factors in the Administration of Gaseous Anæsthetics.

The anæsthetist, he said, altered the gaseous content of the tissues to effect a reduction of oxidation or metabolism in certain nervous tissue without similarly affecting the metabolism of other tissues. This was the result of a combination of factors: (1) The solubility of gases in the body fluids. (2) The difference in oxygen requirements of the different tissues. It had been shown that nervous tissue requires a more liberal supply of oxygen than do other tissues. Consequently, at certain tensions of N_2O and O_2 in the body fluids, the activity of certain nerve-cells was curtailed while other more stable nerve-cells and those of muscle and other tissues would find sufficient oxygen to carry on their normal functions. (3) An absence of chemical change of the anæsthetic gas while in the body. An apparatus for administering gaseous anæsthetics, said Dr. McKesson, must exclude air; it must embody a positive control of the gases administered; it must control the pressure of the mixed gases and regulate rebreathing, and it must provide a means of inflating the lungs with oxygen. He showed how his own apparatus fulfilled these conditions.

Dr. GOLDMAN and Dr. THOMPSON ROWLING (Leeds) also gave demonstrations of apparatus, and Dr. S. R. WILSON gave a lantern lecture on the Evolution of Anæsthesia.

A joint discussion on July 23rd with the Section of Surgery on Anæsthesia in Abdominal Surgery has already been reported in THE LANCET (August 7th, p. 285).

SECTION OF PATHOLOGY AND BACTERIOLOGY.

THURSDAY, JULY 22ND.

At the first meeting of this Section Prof. SHOLTO DOUGLAS (Sheffield), the President, paid a tribute to the late Sir William Leishman, who was to have presided over the Section and through whose efforts the programme was arranged. Those present stood in silence for a moment in honour of the memory of this eminent pathologist.

Dr. R. A. O'BRIEN (Beckenham) opened a discussion on

The Relationship of Streptococci to Scarlet Fever and its Complications.

He summarised the grounds for a belief in the existence of such a relationship as being (1) the invariable presence of these organisms in the throat in scarlet fever; (2) the production (by the Drs. Dick) of clinical scarlet fever by the introduction of cultures of the organisms into the throats of susceptible indivduals; (3) the production of a toxin by the streptococci in question which of itself will produce many symptoms of the disease; (4) the ability of an antitoxic serum, produced against this toxin, to abolish the rash of scarlet fever; and (5) the good therapeutic results obtained by treatment of the disease with such serum. Proceeding to analyse these data, Dr. O'Brien discussed the characters by which the *Streptococcus scarlatinæ* might be identified. The question had been found to present the usual difficulties of streptococcus classification. Culturally there were no features distinguishing such strains from the *Streptococcus pyogenes*, and the most satisfactory method of recognition was by means of the agglutination test which, in the hands of experienced workers engaged upon this special variety of research, gave fairly reliable results. Here, however, as in other branches of streptococcus work, there was overlapping and the identification of individual cultures was difficult: the streptococci closely related to the scarlatinal group were those of erysipelas. Another question awaiting answer was the significance of the various subgroups which serological methods revealed within the main scarlatinal group. Did such division correspond to different clinical types of scarlet fever or were all such groups identical in the results produced? The available evidence pointed to the latter suggestion being correct, and Dr. O'Brien believed that the various subtypes of scarlatinal streptococcus produced one and the same toxin, as do the various agglutination types of *B. diphtheriæ*. The most convincing evidence of the relationship of a given streptococcus to the disease was its power of producing a toxin which gave the specific intradermal reaction (Dick test), and which was neutralised by a scarlet fever antitoxin. Similarly, if an antitoxin made from the toxin of such a streptococcus produced specific blanching of the scarlet fever rash (Schultz-Charlton phenomenon) there was good evidence for assuming a causal connexion of that organism with the disease. An interesting side issue was the determination of the true nature of so-called puerperal scarlet fever, surgical scarlet fever, and allied conditions not of an infectious nature; this problem might be solved by the study of these reactions. There remained the question of the mode of action of the organism. Is it toxigenic or is its action direct as it is in ordinary septic processes? Dr. O'Brien considered that anti-scarlatinal serum, if given early in the disease, gave sufficiently striking results to make it comparable to diphtheria antitoxin; in consequence he believed that scarlet fever, in this stage at all events, was a toxic process.

Dr. C. C. OKELL (Beckenham) dealt mainly with the technical aspects of agglutination and toxin study in connexion with the streptococci found in scarlet fever. The view that these organisms were causal was a satisfactory working hypothesis, but discrepancies were numerous. One of the major difficulties in working upon the condition was the lack of any reliable test for the standardisation of toxin and antitoxin. At the present time the only practical method was by means of the Dick test, which meant working with human subjects, and here the reaction, although definite and specific, was not quantitative. He thought it desirable to carry out standardisation by reference to a known serum rather than to a toxin; such a serum was being prepared in America for the purpose. At the present time toxin neutralisation tests only gave a very rough estimate of the therapeutic efficiency of a serum. The Ramon test had been tried for standardisation but had not been found of any value. Laboratory animals were not susceptible to the toxin although readily killed by the living organisms against which an antitoxic serum might or might not protect them. Dr. Okell's experience of the agglutination test for the identification of the scarlatinal streptococcus agreed in general with the published statements.

Dr. K. E. BIRKHAUG (New York) said that in examining 500 cases of scarlet fever in New York he had found the scarlet fever streptococcus in 96 per cent. during the first four days of the illness. The organisms had disappeared from the tonsillar crypts by about the tenth day of the disease, at which time the patients' blood contained enough antibodies to yield the Schultz-Charlton phenomenon. He had found identical streptococci in non-scarlatinal conditions such as osteomyelitis and tonsillitis. Agglutination was an unsatisfactory method of identification on account of the frequency of spontaneous flocculation, the best criterion being the human skin test. He had examined the Schultz-Charlton phenomenon by Krogh's method of direct examination of the capillaries, and had found that these were dilated to about three times their normal size whilst the rash was present and showed progressive constriction when the blanching serum was injected. He agreed with other speakers as to the efficacy of serum treatment.

The PRESIDENT urged the necessity for establishing an adequate pathological service in connexion with the isolation hospitals of this country. Usually the pathological work was left to persons quite unfitted to do it and an enormous amount of valuable material was not investigated.

Prof. W. J. TULLOCH (St. Andrews) compared the subgroups of the *Streptococcus scarlatinæ* group with those of tetanus. Agglutination differences did not mean differences in the variety of toxin produced. He suggested that the delicacy of the Ramon test for antitoxin estimation depended upon the ions in play and that by studying this factor a usuable modification might be devised.

Dr. PAGE SUTHERLAND (Manchester) spoke of the routine use of the Schick and Dick tests at Monsall Hospital: valuable information as to the chance of cross infection was obtained and the latter test was found useful in confirming the diagnosis. The susceptibility of members of the nursing staff was tested as a routine and prophylactic immunisation of susceptible persons was an important economic measure.

Dr. BIRKHAUG read a paper on

The Streptococci of Erysipelas.

He said that by means of agglutination and absorption tests he had demonstrated that 91 per cent. of hæmolytic streptococci isolated from cases of erysipelas fell into a definite group which was serologically distinct from the scarlet fever group and also from streptococci isolated from common septic conditions. A serum prepared from the erysipelas strains protected rabbits against infection with similar strains but did not confer immunity against streptococci from other sources. The intracutaneous injection of these erysipelas organisms into normal rabbits produced a condition strikingly resembling human erysipelas, and with a toxin obtained from the organisms a skin reaction akin to the Dick reaction could be demonstrated. Dr. Birkhaug further reported results of the use of an antiserum prepared from the erysipelas streptococci and used in human erysipelas. The clinical trial of such a serum in 60 patients suggested that it had striking therapeutic effects when administered early in the disease and in adequate dosage. The average dose given was 100 c.cm. of the unconcentrated serum and in most cases a single dose sufficed. The injection was usually followed by a critical drop in temperature, an amelioration of the general condition, and the disappearance of the eruption. In late cases the chief effect of the serum was in the amelioration of the toxic condition, its local results being less striking.

FRIDAY, JULY 23RD.

Prof. G. L. GULLAND (Edinburgh) opened a discussion on

Leukæmia and Allied Conditions

and reviewed various theories of its nature. From the supposition that the disease was a suppuration of the blood, Prof. Gulland dealt with supposed parasites which in their turn had become discredited. At the present day the view was held in some quarters that it was an infective condition, and certainly cases of acute leukæmia clinically simulated the infections. The leukæmia of fowls was a virus disease and human leukæmia might correspond to it. The sum of all the available evidence, he thought, pointed to the disease being neoplastic, its special features being due to the fact that the white cells of the blood are not normally cohesive and permeate all tissues and fluids without themselves forming a tissue in the proper sense. In leukæmia true tumour masses occurred in the bone-marrow and in certain organs, and the cells overflowed into the blood giving the well-known blood pictures. Prof. Gulland divided leukæmias into granular and non-granular classes, recognising in the latter lymphatic and myeloblastic types. He considered that the cells met with in both classes were derived from a common marrow cell, the myeloblast or lymphoidocyte normally present in the bone-marrow but only active in pathological conditions. Normally, the cells of the non-granular series were derived from a large lymphocyte and those of the granular series developed through an intermediate cell or promyelocyte. The leukæmic process might affect any of these cells at any stage of their normal life-history, but when the granular forms were involved in a chronic type of the disease all the varieties of leucocytes participated in the proliferative process. The reason for the simultaneous involvement of the non-granular cells was hard to find. Both the acute granular and the chronic non-granular forms were rare, the latter being perhaps the most interesting type of leukæmia and often extremely chronic; the glandular enlargement might exist for ten years before the true diagnosis was made. In such cases there was often remarkably little interference with the patient's health until the final breakdown occurred. The existence of an acute lymphatic form of the disease was open to doubt; many cases described as such were the terminal phase of a chronic lymphatic leukæmia and showed very high white cell counts which would indicate a condition of long duration. Others were in reality examples of myeloblastic leukæmia, and it must be remembered that in all such cases a coincident excess of true lymphocytes was the rule. In the early stage of such cases the total white count might be only a little increased, but a certain proportion of myeloblasts would be present, which proportion would be found to increase as the disease progressed. In leukæmic patients death was not due to the excess of white cells, but was a result of accompanying anæmia, hæmorrhage, or intercurrent conditions. The causation of the associated anæmia was interesting. In Prof. Gulland's opinion it was to be found in the rate at which the leucoblastic transformation of the marrow took place. If it advanced slowly, as in the chronic forms of the disease, time was left for compensatory activity on the part of the red-cell producing marrow, but if the process was rapid, or if the leukæmic transformation in chronic cases transgressed a certain limit, the physical possibilities of reaction by the erythroblastic tissue were so reduced as to result in a severe grade of anæmia. As a consequence of irradiation the overgrowth of white cells might be checked and a chance of recovery offered to the red-cell-producing marrow to which it often responded very successfully. With regard to allied conditions, chloroma was a true leukæmia and presented no real difficulties in diagnosis. Whooping-cough and glandular fever sometimes occasioned difficulties; both showed a lymphocytosis and in the latter there was enlargement of the glands and spleen. The greatest difficulty was in the aleukæmic stage of leukæmias, especially where anæmia was a prominent feature; here the diagnosis between leukæmia and pernicious anæmia was often in doubt and ultimate resolution of the difficulty by the pathologist was a result which the speaker strove to avoid.

Dr. S. W. PATTERSON (Ruthin) reviewed a series of cases of disease of the blood-forming organs classified as tumours of glands, tumours of spleen, and tumours of the mediastinum. In the first group he included acute leukæmia (11 cases), glandular fever, and Hodgkin's disease. He remarked that in Australia the combination of tubercle with Hodgkin's disease was not seen in the way it occurs in this country. Under tumours of the spleen he included myeloid leukæmia, and the various types of splenic anæmia and acholuric jaundice. The cases of mediastinal tumour included nine examples of Hodgkin's disease, seven of lymphosarcoma, and four of fibrosarcoma. He expressed the view that the treatment of leukæmia by irradiation was equally destructive to both red and white blood elements.

The PRESIDENT spoke of the difficulty of differentiating the non-granular types and asked what was the value of the oxidase reaction. He put forward the suggestion that leukæmia was sometimes seen in epidemic form.

Dr. R. DONALDSON (London) said that text-book classifications of leukæmia were too rigid. He opposed the view that leukæmia was a sarcomatosis. If this were so, then blood-forming tissue in malignancy behaved differently to other tissues, as instanced by its universal involvement. True neoplasms of

the bone-marrow were rare. He preferred the view that the disease was due to a virus or an irritant; the clinical manifestations were more in accord with such a causation than with tumour growth, and its long duration was opposed to a neoplastic origin. There was an obvious fault in the regulating mechanism of leucocyte numbers whose mode of function was unknown. As far as he had been able to ascertain there was no increase in the incidence of the disease. The records of St. George's Hospital for the last ten years showed the admission of nine cases of acute lymphatic disease, seven of the chronic variety, and ten cases of myeloid leukæmia.

Prof. GULLAND, replying, denied that X rays or other leucocyte-destroying agencies produced anæmia; nothing was more definite than the improvement in the anæmic condition which took place as a result of such therapeutic measures. The oxidase reaction often failed where it was most wanted; only certain myeloblasts gave it and the reaction probably depended on the cells' age. He thought that there was no evidence of an epidemic tendency in leukæmia. With regard to the sarcoma view of the disease, he allowed that it was only provisional, but it was the view which best fitted the accepted facts. The remissions of the disease were quite unexplained; it was possible to produce them by benzol, but he considered that this drug only acted on the circulatory leucocytes; when its administration was stopped they returned with a bound and there was no evidence of its having any effect on the marrow.

Dr. T. S. P. STRANGEWAYS (Cambridge) read a short paper in connexion with his demonstration with Dr. CANTI on

Tissue Culture.

Dark-ground illumination, he said, was better than any other method for studying the structure of the living cell. Man was to be looked upon as a cell colony produced by the repeated division of a single cell, and in his constitution two main types of cell were to be distinguished—the somatic and the germ cells. The somatic cells surrounded the germ cells and formed tissues and organs which are built up for the purposes of the germ cell. The somatic cells possessed the power of multiplication and of reproduction of their own type, but the germ cells were potentially immortal. The death of an animal did not cause the simultaneous death of the body cells, which survived for a long time and might be obtained in cultures made some days after the death of the animal. Cells might easily be cultivated in plasma and certain tissue extracts outside the body and showed in their cytoplasm fat granules, mitochondria, and other structures. In division the cell became round and the nucleus disappeared, to reappear in the form of chromosomes in the later stages of mitosis. Growing cells were mobile and might migrate from place to place. This doubtless also occurred in the body and its extent and possibilities were often underestimated; the extension of tumours was probably largely caused by the mobility of the cells and, further, the repair of surgical wounds was mainly due to their migration. In the formation of an innocent tumour the phenomena seen were multiplication of cells followed by their differentiation and succeeded by a stage of inhibition of further growth; in a malignant tumour the process resolved itself into the multiplication of cells plus some degree of differentiation, but no phase of inhibition followed. The factors here at work were of the greatest interest in connexion with the whole problem of such growths; in ordinary cultures the multiplication of the cells would go on indefinitely if favourable conditions were provided for their growth.

Dr. R. G. CANTI (London) supplemented Dr. Strangeways's remarks by giving a description of the technique of tissue culture and the detailed process of cell division which, he said, lasted about five minutes. He also described some interesting attempts at microdissection of the living cell.

Reviews and Notices of Books.

PATHOLOGY OF THE MOUTH.

By FREDERICK MOOREHEAD, M.S., D.D.S., M.D., and KAETHE W. DEWEY, M.D. London and Philadelphia: W. B. Saunders Company. Pp. 540. 32*s.* 6*d.*

THERE is much truth in the statement made in the preface to this book, that the mouth taken as a whole is a neglected territory, falling between dentistry and medicine. The pathological conditions which occur in the mouth may be intimately connected with the teeth and associated structures or quite unrelated to these organs, and a wide knowledge of general medicine as well as of dental disease is essential if these conditions are to be differentiated. There was undoubtedly room for a book devoted entirely to the pathology of the mouth, and it is the more disappointing that the volume before us is very unequal in merit. Curiously enough the strictly dental part of the book is the least satisfactory.

Three pages only are devoted to dental caries, no illustrations of the morbid anatomy being included. The opening chapter on anomalies of the teeth and jaws is so brief and uninformative that, as it stands, it is useless and might with advantage be omitted. The chapter on harelip and cleft palate is disappointing. Harelip is described as the commonest defect; but although it may occur unaccompanied, in the majority of cases a harelip is associated with a complete maxillary cleft. The chapter on pyorrhœa, on the other hand, is good and embodies a fairly complete account of the pathology of this condition so far as it is understood. In the account of diseases of the dental pulp there is no mention of the condition sometimes described as "pink spot," in which there is absorption of the tooth from within, without any external lesion. In discussing hypoplasia of the teeth the authors state that the defective formation of enamel is counterbalanced by overdevelopment of the interglobular spaces in the dentine. This is surely a misreading of the condition. The excessive formation of interglobular spaces in dentine is itself a hypoplasia and is precisely analogous to the defects in the enamel. The authors are wrong in stating that the enamel of the deciduous teeth is completed at birth. So far from this being the case not more than about two-thirds of the crowns of the incisors is formed and proportionately less in the molars and canines.

The account of the various oral manifestations of syphilis, leprosy, actinomycosis, and tuberculosis are excellent and well illustrated. The diseases of the tongue are fully described, though the addition of illustrations to this chapter would greatly have increased its value. The account of the tumours of the mouth is on the whole excellent. Especially good is the section on the fibrous and myeloid epulis. The authors discuss fully the pathology of the myeloid epulis and are evidently conversant with the extensive literature on giant-celled tumours. The description of the cytology and morbid anatomy of these interesting tumours is admirably done. The description of the odontomata is not so good; Bland-Sutton's classification is given but the authors do not follow it. There is no mention of the valuable classification introduced by Gabell, James, and Payne, though it is by now well known and appreciated by oncologists.

There is a long bibliography appended to the book which adds much to its value, though not many British references are included. Where illustrations are inserted they are for the most part original and admirably reproduced. The book will undoubtedly prove useful to students and practitioners, while if in a future edition the weaker sections are brought up to the standard of the rest, the authors will do a service to medicine and dentistry.

OTOLOGY.

Contributions to the Art and Science of Otology. Lectures and Papers by RICHARD LAKE, F.R.C.S., 1892–1925. London: Macmillan and Co. 1926. Pp. 255. 15*s*.

THIS collection of original addresses and papers covers a large number of matters within the domain of otology, and ranges from short notes, mostly on points of real interest, to detailed articles on considered subjects. Of especial interest are a series of papers on vestibulotomy in non-suppurative disease of the ear for the relief of vertigo. In one of these papers, which, with many others, originally appeared in THE LANCET, he reported in 1911 10 cases in which he had performed this operation with, apparently, considerable success. Several of the papers are in French, having first been published in the *Archives Internationales de Laryngologie*. We notice an odd misprint in the title of one of the papers translated into French, "Factem dans la Genève de Maladies du Nez et des Oreilles," "Factem" being obviously Factum, and "Genève" Genèse. Taken as a whole, this collection shows an observer with a keen mind and an ardent worker, the results of whose large practical experience are worth study by practitioners as well as by specialist workers. The papers record first-hand experience.

IMMUNITY IN TUBERCULOSIS.

The Principles of Immunity in Tuberculosis. By W. CAMAC WILKINSON, M.D., late Lecturer in Pathology and in Medicine at the University of Sydney. London: Nisbet and Co. 1926. Pp. 141. 10*s*. 6*d*.

THIS book, as we learn from the preface, was written to prepare the way for the reopening of a tuberculin dispensary in 1926. In the first chapter, which deals with the modern conception of tuberculosis, Dr. Wilkinson supports the current view that much of the infection in civilised communities takes place during childhood, and later he quotes German statistics of the war period to show that soldiers who bore the stigmata of tuberculosis or who had a personal or family history of the disease, resisted a subsequent attack better than those who had no such history or stigmata. In conformity with the modern German view he regards the biological history of the disease as closely analogous to that of syphilis. Thus he speaks of a primary sore or lesion, a secondary stage when "the tubercle bacilli, like the treponema, spread along the lymphatics that drain the site of infection," and a stage of tertiary manifestations which usually takes the form of chronic phthisis. The bovine bacillus he regards as being of relatively little importance, and in an italicised passage he states that if bovine tuberculosis were eradicated from cattle in Great Britain it would not seriously diminish the death-rate from tuberculosis in human beings.

In a chapter on chronic phthisis, Dr. Wilkinson lays down 11 main facts of the pathological picture of the disease, with which other experts would largely agree; but when he reaches the question of early diagnosis he diverges from the views generally held. After pointing out that "occult, larval, latent tuberculosis cannot be determined . . . by the most meticulous search for physical signs that do not exist or cannot be seen or heard at the surface of the body," he goes on to state that "by the touchstone that can explore the deep, distant, hidden, mysterious activities of cell life, we can touch and awaken signs and symptoms as latent and quiescent as the disease itself"—that is to say, by the diagnostic use of tuberculin. Setting aside a very short chapter on the nature of immunity in tuberculosis, in which the author strongly favours the cellular rather than the humoral hypothesis, the rest of the book is devoted to an exposition of the tuberculin dispensary, its methods, and its value. Here he is dogmatic and at times manifestly on the defensive against critics whom he holds to be both ignorant and unreasonable. In reply to the criticism that the tuberculin dispensary may be a dangerous place he retorts: "The essential difference between my methods and my critic's is that I can detect the other cases [i.e., those which are not acute] without fail at an early stage and restore them to health. My critic cannot because he is too timid to use the only means of demonstrating this difference."

No detailed instructions are given in the book as to the methods of dosage employed, and no mention is made of the problems of standardisation of tuberculin which are exercising the minds of immunologists at the present time. The author apparently regards these matters to be outside the scope of the present work, which is frankly the advocacy of the tuberculin dispensary in the treatment of tuberculosis. To this extent the title of the book is misleading.

THE EVOLUTION OF ORTHOPÆDIC SURGERY.

By ROBERT BAYLEY OSGOOD, A.B., M.D., John B. and Buckminster Brown Professor of Orthopædic Surgery in Harvard University. St. Louis: C. V. Mosley. 1925. With 49 illustrations. Pp. 70.

ON the flyleaf of this brochure we are told that the terms of the gift of the Detroit Orthopædic Lectureship Fund, established Nov. 24th, 1922, provide for the publication of the lecture, and for the free distribution of the same to such societies, libraries, and individuals as shall be selected by the Lectureship Foundation Committee (of the Wayne County Medical Society) as most appropriate. In accordance with these terms we have been presented with this historical survey of orthopædic surgery. Our professional brothers in the United States are setting a good example in the interest that they are evidently taking in the history of our art. Dr. Garrison's works on this subject are well known and only a few weeks ago appeared the handsome book on pediatrics of the past by Dr. Ruhräh, of Baltimore. The report of the lecture now under notice is a valuable if less ambitious effort in the same direction. Its author acknowledges inspiration to some extent from the "Menders of the Maimed," by Keith.

Dr. Osgood wisely declines any attempt to define orthopædic surgery, which, however, as he points out, did not really originate before 1800. After a short sketch of the medical art from the mythical Podalirius and Machaon to Francis Glisson, and a brief excursion into the history of the physiology of periosteum and growing bone, and a short notice of John Hunter and Sir (sic) Percival Pott, we come to the early orthopædic surgeon Delpech, who has received much unmerited credit for a share in the invention of subcutaneous tenotomy but whose book, "L'Orthomorphie," was the first really important contribution to the literature of the subject, seeing that Audry's Orthopædia contained little that was surgical. Dr. Osgood has enriched his pages with portraits and biographical notes of some of the leaders in surgery and its ancillary sciences who are not generally considered to have been orthopædic surgeons, but on the plea that they contributed to our knowledge of the framework of the human body their inclusion may perhaps be justified; but if Paget and Brodie are to be claimed as orthopædic surgeons, where is the line to be drawn? The numerous reproductions in this little book of portraits of distinguished physicians, surgeons, and physiologists are not worthy of the high reputation of American book-illustration; they are for the most part disappointing.

THE LAW RELATING TO INJURIES TO WORKMEN.

Third edition. By FREDK. G. NEAVE, LL.D., Solicitor. London: Effingham Wilson. 1926. Pp. 160. 2*s*.

THIS new and revised edition of one of the series known as Wilson's Legal Handy Books deals concisely with injuries to workmen under the common law, under the Employers' Liability Act, and under the

Workmen's Compensation Acts, 1906–1924, as well as with the cases decided under these statutes. It is a judiciously compressed legal statement, showing the workman's choice of remedies under the not very logical system of alternatives which Parliament will perhaps one day coördinate and simplify. In a book so recently published it is unfortunate that the author was unable to include references to the consolidating Workmen's Compensation Act of last year. This Act, it will be remembered, came into operation on May 1st of 1926, and, with a few minor exceptions, replaces the previous Workmen's Compensation Acts ranging from 1906 to 1924. The author's general statement of the law, and (so far as it goes) of its historical development, remains unaffected by the omission, but his references to what are now repealed statutes are misleading. Text-book writers deserve all sympathy when Parliament thus upsets their publications, but it was known last year that the process of consolidation was impending, and it would have been better to delay this book till the effect could be stated.

A HISTORY OF THE LONDON HOSPITAL.

Third edition. By E. W. MORRIS, House Governor of the Hospital. London: Edward Arnold and Co. 1926. Pp. 303. 7*s.* 6*d.*

THE third edition of this excellent history, which first appeared in 1910, has been brought up to date, and gives information as to the various changes which have occurred during the intervening period. Many new departments have been organised, new buildings to house those departments have been erected, and the staff also has suffered changes. A notable date was the year 1921, when Lord Knutsford completed his twenty-fifth year of service as chairman of the hospital. How much the hospital owes to Lord Knutsford's energy, tact, and humour as a successful beggar for the charity over which he presides cannot be put down on paper. The tabular chronology of the hospital at the end of the book is interesting as showing that the duty of almsgiving is still widely recognised amongst all classes; the sums received vary from small amounts and more and varying substantial donations to an anonymous gift of £50,000 for endowment for medical research to the new sun baths given by patients who had received Finsen light treatment. The account of the treatment and accommodation at the hospital in its early days may well make the modern patient thankful that he did not live in those times, and there is a grim description, p. 57 et seq., of the course of a case of compound fracture in pre-Listerian days: "The patient did well for ten days, at the end of which he complained of his bowels and of a shivering, and that upon opening some abscesses, which were found gathering in his leg, the discharge was so great that he lost his appetite and sank under it. . . . Mr. Harrison had ordered him fish, chicken, or anything else he could eat, and large nosegays to prevent his being affected by the stench of his leg, and that the man was thankful, and particularly so on the day of his death." Many a sufferer must have welcomed death as a release from a surgical ward in those days.

Mr. Morris's book is worthy of the great institution of which he is so faithful and efficient a servant.

JOURNALS.

JOURNAL OF PHYSIOLOGY. Vol. LXI., No. 3. June, 1926. Pp. 305–464. Cambridge University Press.—Lady Briscoe reports investigations on Conduction of Respiratory Nervous Impulses through Regions of Block Produced by Pressure. These investigations she has summarised in THE LANCET (July 10th, p. 56).—Prof. J. Mellanby contributes an account of the Experiments on the Secretion of Pancreatic Juice, referred to in his paper in THE LANCET (July 31st, p. 215).—The other papers are as follows: The Conduction of a Nervous Impulse in a Narcotised Region of a Nerve, by Sybil Cooper. Until challenged recently by Kato in Japan and Forbes in America (1924) it has been taken as an established fact that when subjected to narcosis or other depressing influence a nerve conducts with a decrement—i.e., that the actual change observed is reduction of the ability of conduction through narcotised nerve. Experiments with frogs' nerves, narcotised with alcohol and chloral hydrate, indicated that there is conduction with a decrement and no lengthening of the recovery. The author's results on the whole do not confirm the work of Kato, but they are in agreement with the work of Lucas and others.—The Blood Count and Body Temperature in Normal Rats, by Arthur Dighton Stammers. The normal red cell count in rats is in the region of 8,700,000 per c.mm. at sea-level. At an altitude of 6000 feet (Johannesburg) there was an increase of under 6 per cent., as compared with the 20 per cent. increase seen in normal human blood at this altitude. The range of body temperature of the rats in the writer's colony was 96·8°–102·2° F. Under normal circumstances, and seemingly the same conditions, the temperature of the rat apparently varies within 2° or 3°.—On Cellular Activity and Cellular Structure as Studied in the Thyroid Gland, by W. Cramer and R. J. Ludford. The thyroid was chosen for an attempt to establish a correlation between changes in functional activity and in the structure of the cytoplasm as indicated by alterations in the mitochondria and the Golgi apparatus—both of which structures can be seen in living cells, and are, therefore, not artefacts. Conditions were established which induce intense activity and complete inactivity respectively of these glands. Exposure to cold and the injection of β-tetrahydronaphthylamin produce an intense activity of the gland, while a resting condition is induced by exposure to a hot environment and by thyroid feeding. A very clear relationship could be demonstrated between the functional state of the gland and the mitochondria. In the resting gland the mitochondria are barely visible. In the active gland they show an enormous enlargement. The condition of the mitochondria, therefore, presents a criterion for the functional state of the gland, and may, as Goetsch has suggested, be useful in the study of pathological states of the gland. The Golgi apparatus shows the same changes which have been observed in the other gland cells in rest and activity—a simple contracted form in the resting cell, an enlarged convoluted form during activity, followed by a disintegration into granules. Several illustrations show the appearance of sections of the gland of the mouse at room temperature, the immediate effect of cold following heat, and the immediate effect of heat following cold, the differences being most striking. A pictographic summary of sections of the gland under various conditions of activity is given, and the significance of the mitochondral changes from the point of view of cell mechanics is discussed. The mitochondria represent a mechanism by which the cell can produce great variations of surface energy within the cytoplasm. On the basis of accepted views such variations must be accompanied by changes in the distribution of the lipoids within the cytoplasm and the cell membrane. These changes, in turn, would affect the permeability of the cell.—The Venous Pressure of the Eye and its Relation to the Intra-ocular Pressure, by W. Stewart Duke-Elder. The author describes the methods he adopted to measure the pressures in the intra-scleral veins in dogs, that in the extra-scleral veins, the intra-ocular veins, and the variations of venous pressure with intra-ocular pressure.—The Spleen and the Resistance of Red Cells, by D. Orahovats. R. M. Pearce has shown that the resistance of the red cells of the blood from the general circulation to hypotonic salt solutions is greatly increased after splenectomy. The resistance of the red cells of the spleen pulp was compared with the resistance of the red cells of the body (1) to hypotonic salt solutions, (2) to saponin solutions. It was found that the red cells contained in the spleen pulp are less resistant to hypotonic solutions than the red cells from the general circulation, and the former

are more resistant to saponin solutions than the latter. The statement of R. M. Pearce regarding splenectomy is confirmed.—On the Output of Hæmoglobin and Blood by the Spleen, by E. W. H. Cruickshank. A method is described for estimating in cats the blood and hæmoglobin output of the spleen without exposure of the organ. It is shown that the capacity of acting as a reservoir for blood and of concentrating hæmoglobin is a peculiar property of the spleen not shared by other muscular organs—e.g., the tongue.—The other papers are: The Osmotic Pressure of the Proteins of Human Serum and Plasma, by E. B. Verney; The Relation of Work and Heat in Tortoise Muscle, by Jeffries Wyman, jun.; The Influence of Length on the Responses of Unstriated Muscle, by F. R. Winton; and Determination of the Hydrogen-ion Concentration of the Blood, by L. E. Bayliss, P. T. Kerridge, and Ruth Conway Verney.—A paper by H. H. Knaus, on the Action of Pituitary Extract on the Pregnant Uterus, is reviewed on p. 343.

MEDICINE AND THE LAW.

Inquest Quashed: Duty to View Body.

AT a Lancashire inquest held last March the jury found that the deceased, a boy of 16, committed suicide by shooting. Application was recently made to the Divisional Court for a rule *nisi* for a writ of *certiorari* directing another inquest to be held because the coroner had not viewed the body. The rule has, after argument, been made absolute; a fresh inquest has been ordered, or rather it has been decided that the inquest without view was no inquest at all and that, therefore, an inquest must be held which may be held before the same coroner. The coroner made an affidavit explaining that, owing to difficulties of transport, he arrived late at the inquest; he was told by the police officer that the jury had already viewed the body and were waiting for him. In these circumstances, being a solicitor with no more medical knowledge than the jury, he considered (wrongly, as he now admits) that no useful purpose would be served by his viewing the body, especially as he had had a medical report before he had ordered the inquest. But, though a solicitor, he forgot that Section 4 of the Coroners Act of 1887 says that "the coroner and jury shall, at the first sitting of the inquest, view the body." This omission was fatal to the validity of the inquest. It was argued on behalf of the coroner that, by the passing of the 1887 Act, Parliament outlined (in Sections 4 and 5) certain routine proceedings, and authorised the High Court (by Section 6) to dispense with a further inquest at its discretion if any irregularity had occurred. The Lord Chief Justice, following the leading case of R. *v.* Ferrand decided in 1819, rejected the argument and held it to be a condition precedent that there should be a view of the body. On an application for costs, the coroner, Mr. D. M. Haslewood, was ordered to pay a sum not exceeding £10 towards the applicant's costs.

It may be remembered that the Government's Bill dealing with the law of coroners proposes to amend Section 4 of the 1887 Act. The Bill says: "At or before the first sitting of an inquest on a body the coroner shall view the body, and, if before the body has been buried, the coroner so directs or a majority of the jury so desires, the body shall be viewed by the jury also." View by the jury (which has been noted by observers as often a perfunctory performance where the jurors are persons of refinement) is scarcely necessary except where there are wounds or injuries which raise the question of self-infliction or otherwise. The recent Lancashire case was of this nature. The boy had a Mauser pistol, apparently taken with him for the purpose of shooting rabbits. His body was found in a lane one morning, having apparently been in that position since midnight. The pistol was lying near him. There was a lacerated wound in the left temple and a punctured wound in the right. Medical evidence indicated that the bullet entered on the left side. The boy was left-handed and in his left hand was found a partly-smoked cigarette. His relatives felt that a verdict of suicide was less probable than one of accident or murder; hence, their application to quash the inquisition. In face of the coroner's statement and the fact that the jury had viewed the body, it does not seem that the coroner's omission to view made any difference to the verdict. The view by the coroner, however, whether under the law as it was before 1887 or under the law since 1887, or under the law as it will be if the Coroners (Amendment) Bill passes, is an indispensable formality. An inquest must be, in the old phrase, *super visum corporis*. No view, no inquest.

Professional Discipline Cases: Appeal to High Court from Quasi-Judicial Bodies.

It is notorious that from time to time there has been strong criticism of the decisions of the disciplinary tribunal to which Parliament has entrusted the task of dealing with "infamous conduct in a professional respect." It has been pointed out that in other professions than that of medicine there is the safeguard of a right of appeal to the High Court from the sentence of the professional tribunal. Such a right of appeal is conceded, for example, to the solicitor whose conduct has brought him before the disciplinary committee of the Law Society. It was observed in this column some weeks ago that an appellant must not expect too much of this privilege of appeal to the law courts. The Lord Chief Justice, presiding over the Divisional Court, which was hearing one of these appeals under the Solicitors Acts, said that the legislature had made the Law Society master in its own house, and added that, unless the Society had gone wrong upon some question of principle or law, the matter was one for the Society's discretion and the Court would be very reluctant to interfere. This particular appeal has lately found its way to a higher court, where the Master of the Rolls has emphasised afresh the discretionary powers of the Law Society. "It is impossible," he said, "for any Court to lay down the exact principles upon which the Law Society must base its decisions; the legislature has entrusted it with the duty of estimating the standard of conduct to which a solicitor must attain in order properly to carry out his duties; no one could be more competent, more wise, or perhaps more merciful in judging these cases than the Law Society." One can hardly doubt that the law courts would display the same reluctance to interfere with the decisions of the professional tribunal if Parliament were moved to grant, by way of safeguard, a right of appeal to the High Court in cases under the Medical Act.

The professional discipline tribunals of lawyers and of doctors have been described as quasi-judicial; if they act judicially, the law courts will be slow to interfere with their decisions. On the other hand, if they fail to give natural justice, interference will be speedy enough. This principle is illustrated by the recent case of Captain Peter Wright against the Bath Club. A club committee, acting without bias and in accordance with the club rules, can expel a member (if the rules so provide) after first notifying him of the charges made against him and after giving him an opportunity of answering those charges. A club committee is a quasi-judicial body; it is necessarily invested with a discretion to act in what it deems the best interests of the club. Captain Wright won his action against the Bath Club because the committee had strangely failed to acquaint him with the charges against him and to give him a hearing. This was a denial of natural justice; the quasi-judicial body had failed to act in a judicial manner, and so the law courts intervened. If one could imagine the committee of the General Medical Council similarly lapsing from judicial standards and condemning a doctor unheard, the law courts could, and doubtless would, intervene even in the present condition of the law.

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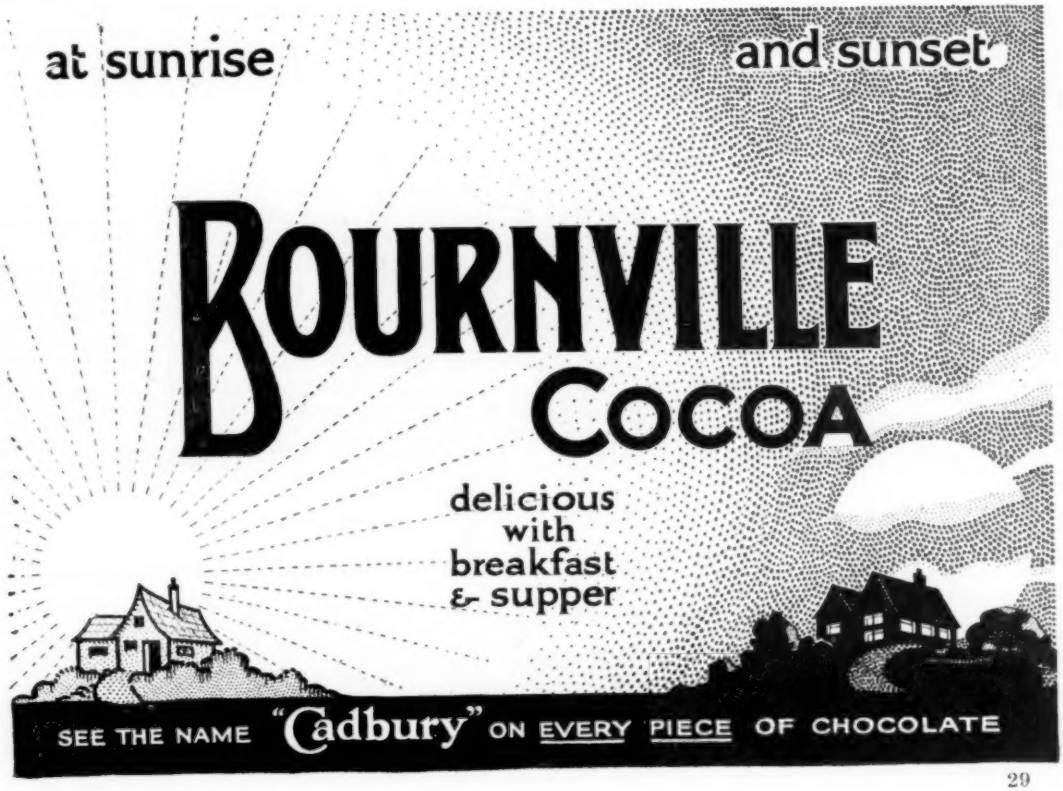

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THE LANCET.

LONDON: SATURDAY, AUGUST 14, 1926.

THE FACTORY BILL.

A QUARTER of a century has elapsed since the last Consolidating Act of 1901, and during the period not only have considerable alterations and additions been made to our code of factory legislation, but great changes have taken place in the outlook on such legislation. A Bill, distinctly overdue if only on account of the need to simplify the procedure of enforcement, has now, however, been introduced to consolidate enactments at present scattered in 13 different Acts. The medical importance of this Bill is considerable, since the factory code is one of the greater arms of the spreading tree of preventive medicine. The student of factory legislation, as he peruses it, must inevitably think of the past great fights fought by OASTLER, Lord ASHLEY, better known as Lord SHAFTESBURY, and others a century ago, of the opposition from political economists and the Manchester school, and of the great victories won to which we are heirs. In addition to consolidation, the Bill proposes several important legislative advances. The old distinction between factories and workshops is to disappear, and also between textile and non-textile factories; a working week limited to 48 hours for protected persons is adopted; permission to use the shift system, which has been on trial since 1920, is included; work on the structure of ships in dock is brought within the Bill, and so are building operations—an important extension. In many directions provisions are strengthened in the light of administrative experience and are widened, as, for instance, when workers are not merely forbidden to interfere with or misuse appliances provided for health, safety, or welfare, but have placed upon them the duty of using such appliances.

The medical profession will be particularly interested in two proposed variations in procedure. The first concerns the enforcement of sanitary conditions in workshops which is at present entrusted to local sanitary authorities. The new Bill transfers enforcement to the factory inspectorate, and over this matter controversy is certain to arise. On the one side the principle may be advanced that adequate enforcement with maintenance of the standard of equipment is best attained through the activities of expert inspectors who, moreover, are concerned with the other provisions of the measure, and have been in the past accustomed to deal with these provisions so far as all places, except workshops, are concerned; the principle is that of unification of inspection. Further, the inspection is entrusted to persons entirely independent of all local influences. On the other hand, local authorities may claim that they should not only retain their present powers but have them extended to all places contemplated under the Bill; that the authority which is responsible for cleanliness, overcrowding, ventilation, and drainage for all other purposes in a district should also control these matters in the factories of the district; that these are matters affecting the general health of the district for which they are responsible, and calling for medical supervision rather than for non-medical inspectors, for only in this way can local authorities become acquainted with the way in which the industries of their districts are carried on. Their claims are logical, since enforcement of all sanitation in each district would thus be unified. Presumably the Government departments concerned have come to agreement, but medical officers of health, as representative of local authorities, may yet object that their view-point has not been fully considered. Possibly the balance for efficiency leans towards the procedure embodied in the Bill. But whatever be the final issue, the present system of dual control is unsatisfactory.

The second matter of particular interest to doctors concerns the medical examination of young persons proposing to enter on factory life of any sort. This work is laid down to be performed by "appointed doctors," and no allusion is to be found anywhere to the existing office of certifying factory surgeon, except where it is stated that under the Workmen's Compensation Act, 1925, references to a certifying surgeon shall be construed as references to an "appointed doctor." The provisions governing the examinations have been recast and strengthened, while local education authorities are called upon to produce to an "appointed doctor" the school medical record of young persons, and this officer is defined to mean a medical practitioner duly appointed to act, the appointment resting usually in the hands of the Secretary of State or chief inspector. As he is to be appointed for individual factories rather than for whole districts, the assumption is reasonable that some choice of doctor may now be accorded to each establishment. His fees and duties may be determined by the Secretary of State, but contracts for service are not ruled out, nor is extension of duties beyond the examination of young persons—indeed the possibility of such extension seems adumbrated elsewhere in the Bill when power is taken to arrange by order for special medical supervision of workers, where the amount of sickness or some other reason renders it desirable. Somewhat unaccountably no power is given to an appointed doctor to inspect the work upon which a young person is to be employed; the omission ought to be rectified before the Bill becomes law. Taken as a whole, while much must depend upon the way in which the scheme of appointed doctors is administered, it seems to give opportunity for the development of an adequate factory medical service such as industry, in its own economic interests, to-day badly needs. In one direction, however, an interesting, but not very promising innovation is allowed for by permitting the transference of the appointment and duties of an appointed doctor to a county council. Should use ever be made of this proposal, a factory would lose any say in the personality of its appointed doctor, while any extension of duties for supervising the health of adults would carry the whole-time public health staff into a realm at present unexplored by it and might end in the creation of another blind alley service, in addition to those of tuberculosis officer and school medical officer. This may be due to some interdepartmental compromise, but the factory medical service will have a better chance if it be free from dual control.

The new Bill, of which our Parliamentary correspondent makes a full abstract elsewhere, contains, among many useful health provisions, the power to secure sufficient and suitable lighting in factories, and to insist on the precautions to be adopted in places where dangerous fumes accumulate—for example, in tar stills and boiler flues. It is a piece of useful and progressive legislation, the result of careful preparation. Unless profoundly altered by Parliament before being placed on the Statute Book, it will rank as worthy of a great legislative ancestry.

THE MICROSCOPY OF THE LIVING EYE.

THE eye is easily accessible and lends itself to objective examination because its media are transparent; slight subjective disturbances in function are regarded as important by everyone, and the consequence is that clinical investigation has reached a higher degree of exactitude in the eye than in any other organ. Elsewhere the clinician reasons largely by inference, and medicine has to rely on morbid histology for the elucidation and interpretation of its clinical conditions. While no one will deny the value of this indirect method of pathological investigation or the importance of post-mortem lessons, undoubtedly they must give way to any technique which permits the direct study of pathological processes as they unfold themselves in the living tissues. Ophthalmology has thus become the most exact of the branches of medicine, and each improvement in technique has given an immense stimulus to its progressive advancement. The first of these advances may be said to have been the introduction of focal illumination by HIMLEY over 100 years ago, but the difficulties of the method and the limits of its effectiveness, on account of the indifferent optical appliances and means of lighting available at that time, set severe limitations on its immediate extension and value. The second was the discovery of the ophthalmoscope by BABBAGE in the middle of last century, which, throwing open new and fruitful fields of study, was the prelude to the greatest activity that ophthalmology has ever known. It is difficult and not a little dangerous to assess the ultimate value of contemporary events, but the introduction of the slit-lamp by ALVAR GULLSTRAND in 1912 bids fair to have begun a third epoch of stimulating progress, wherein old problems are being attacked and solved, new ones are being opened out, and a fresh perspective, presented with a precision hitherto unknown, is being unfolded.

An account of the principles involved in the new method, and some of its practical applications, will be found elsewhere in this issue in the Montgomery lecture, delivered by Mr. HARRISON BUTLER, who has done not a little to further this new branch of knowledge. To the clinician practising ophthalmology the slit-lamp is invaluable, and what was a luxury yesterday promises to become a necessity to-morrow. The fear that its complexity would necessitate its confinement to the field of clinical research and preclude it from routine practice is unfounded. The expert—and it is within the powers of the average person to become to a very large extent an expert—in a period of time not much longer than it takes to read these lines, can bring successively into focus the corneal surface, its parenchyma and its endothelial layer, the aqueous, the intimate structure of the iris, the capsule, the complex configuration of the internal structure, the posterior surface of the lens, and the delicate framework of the vitreous. These may be examined with an ease and precision hitherto unapproached, each presented with a wealth of detail, and localised in its true perspective in three dimensional space. An additional complexity, the contact-glass, which is needed for examination of the posterior part of the vitreous and the retina, is unsuitable for the vast majority of patients, and in its present stage of development probably presents too many difficulties and takes up too much time to be of much clinical value. The cornea, from its position and great transparency, is the structure most readily examined, but it is also the structure most amenable to detailed study by the older methods, and it is in the anatomy and pathology of the lens that the greatest increase to our knowledge has been made. This tissue is found to have, optically, a most complicated formation, and cataract is found to be a disease showing many unsuspected different and well-differentiated types. The immense amount of data collected by VOGT and his co-workers during the last few years, which is being rapidly sifted and added to in this and other countries, is throwing new light on this condition. With the slit-lamp the process of opacity formation can be detected in its most early stages before any change can be made out by the ophthalmoscope or any functional defect is noticed by the patient; exact localisation of its site and details of its structure can be obtained, a minute record of its progress can be made, and it is claimed that it is possible to reach some conclusion as to its probable rate of development and ultimate termination. In many other conditions the observer can see fine points of diagnostic importance which could not formerly be made out at all or only with difficulty, or when they had reached a stage of development which we are now in a position to consider as gross: these include slight vascularisation of the cornea, minute keratic precipitates, early opalescence of the aqueous, and small pigmentary remnants on the lens capsule. The importance of their recognition can be realised when it is remembered that upon the presence or absence of such conditions rest some of the most grave decisions in ophthalmological practice.

It is to be remembered, however, that the method has its well-defined limitations. Enthusiasm for a new subject is apt to lead to an over-liberal estimation of its value. Slit-lamp microscopy is merely an adjunct, a refinement, of the older methods of examination; it does not supersede but merely amplifies them, and it must be allotted not more than its due share in the general scheme of routine examination. To rely upon its aid alone is to lose all sense of perspective, and to run a grave risk of misinterpreting the changes seen and of forming a wrong conception of their significance; it is to make the mistake of using the direct method of ophthalmoscopy without the indirect, of examining a microscopic slide with the oil-emulsion lens before the low-power objective. Nor can the method supersede the study of minutiæ with the microscope. The useful magnification is limited by the inability of the patient to maintain fixation, which places the slit-lamp outside the scope of cytological and bacteriological studies. It provides no substitute for differential stains and reagents, and —what is often forgotten—the pictures it delineates are largely optical phenomena, capable of varying interpretation. The interpretations of different observers are not always in accord, and long experience is required to form an adequate judgment on the finer points. Many of the interpretations, now somewhat loosely accepted, will have to be revised; new appearances will be described, and new values put upon the old. The study is still in its infancy, and it will be long before it has definitely established itself and given to us all the potentialities which it possesses. To the clinician the slit-lamp offers fresh opportunities for adding to the store of his knowledge pictures and conditions which are available by no other method, and it provides him with means for the easier and more confident detection of signs which may be of the greatest import at a stage at which they have hitherto been unrecognisable. To the pathologist it discloses processes in significant detail as they occur topographically and unchanged by artefact, which are often without significance when considered post mortem as isolated findings. To the anatomist it

has opened up a new structure of the living eye; the anatomy of the lens is being elaborated at a pace which has made our most modern text-books obsolete, and ten years ago the structure of the vitreous was unknown. To the embryologist it has given a new conception of the embryonic remnants; to the physiologist of the eye it gives new scope for the study of the activity of the pupil and the mechanism of accommodation; but by the general physiologist it seems to have been so far neglected. As far as we are aware no serious attempt has been made to turn to experimental purposes the physiological possibilities offered by observation, under microscopic magnification, of nerve-fibres or newly formed capillaries in the substance of the cornea, or of normal capillaries in the conjunctiva near the limbus in their natural surroundings. We think we are right in saying that COCCIUS was the first in 1852 to study the minute limbic vessels and to observe the circulation in them, but this work seems to have been largely forgotten. They are easily examined; their dilatations and contractions and periods of complete obliteration, the stream of corpuscles within them progressing by pulsations, now proceeding and now stopping, just as described by KROGH and others in less accessible surroundings, are very evident. New-formed vessels also, composed of a single endothelial layer and showing pulsatory activity, can be induced to wander into the transparent cornea after an inflammatory lesion. The study of these, by means of the slit-lamp, in their natural environment, and the study of their reactions to stimuli and to drugs, might be useful in a branch of physiology upon which much attention is being focused.

ACID MILK IN INFANT FEEDING.

THE recent minor heat-wave was associated with the usual sporadic outbreaks of acute gastro-intestinal disorder in infants, and serves to remind us that though many of the ætiological factors in such diseases are now more clearly understood than formerly, the story of their pathogeny remains far from complete. The growth of the infant welfare centres has done much to diminish epidemics of summer diarrhœa, but the therapeutic problems in individual cases remain hard to resolve. On page 322 of our present issue we publish an article by Dr. ETHEL CASSIE and Dr. URSULA COX recording results obtained at the Carnegie Institute, Birmingham, by the use of lactic acid milk in the feeding of babies suffering from wasting and gastro-intestinal symptoms. In the first part of this article the writers discuss the factors governing the acidity of the gastric contents in infants. The problem is a difficult one owing to the limitations imposed on the observer in the choice of test-meal, and the necessity for avoiding the too frequent passage of stomach-tubes; the conclusions of the authors have consequently been given with considerable reserve. The second part of the article deals with their clinical experience with sour milk feeding. It must be noted that a preliminary trial of more orthodox methods eliminated the majority of simple cases, leaving a number of obstinate ones. The success of the treatment shows it to be worthy of extensive trial, and we hope that these observers will soon be in a position to publish results from a larger series of cases, with fuller investigation of the nature of the changes in the intestinal flora which may occur as the result of feeding with milk thus impregnated with *B. bulgaricus*. It is still uncertain whether bacterial replacement is a feasible proposition, but the observations of most workers tend to show that milk for such purposes must always be prepared in the laboratory and that trade preparations claiming to yield cultures of *B. bulgaricus* and *B. acidophilus* are for the most part inert and useless. Readers interested in this subject will find it admirably reviewed in a recent work[1] by N. KOPELOFF. Working chiefly with asylum inmates, he was able to relieve obstinate constipation almost without exception by giving daily doses of milk containing cultures of *B. acidophilus*. The results in cases of chronic diarrhœa were often extremely encouraging, though by no means so certain. Bacteriological investigation of the fæces of these patients showed that it was necessary to give the milk cultures over rather long periods in order to obtain a free growth of *B. acidophilus*; though subsequent arrest of treatment finally led to the organisms disappearing from the stools, this did not happen for a considerable period. The bacterial flora of the intestine presumably may take some time to reach equilibrium after the introduction of a different type of organism, in somewhat the same way as the smooth working of a sewage purification system requires a few days to adjust after the introduction of the appropriate bacterial sludge, although, when equilibrium has been established, the process continues unchecked for an indefinite period without further interference. From the theoretical point of view there is little doubt that bacterial implantation offers immense therapeutic possibilities, and it is to be hoped that the next few years may see an increase in the clinical and experimental study of the subject. Relevant to this subject is the increasing vogue of milk pasteurisation to which Mr. T. MCLACHLAN draws attention in an important letter in our present issue. Dr. ERIC PRITCHARD has stated more than once that his chief objection to the indiscriminate use of commercially pasteurised milk is the selective lethal influence which pasteurisation has on the bacterial flora, and this point is emphasised by Mr. MCLACHLAN. Dr. PRITCHARD laments our ignorance of the significance of a mixed bacterial flora in the alimentary tract. We hardly know, he has said, what is normal and what is not. At the Infants Hospital, however, although the milk-supply is beyond reproach, a practice is made nevertheless of souring any milk which is supplied to premature or young babies who are not breast-fed. Current American practice does not go as far as that, for Dr. C. G. GRULEE, one of the recognised experts in infant feeding, stated in a recent address[2] that acid milks are necessary in only 1 in 300 cases of infant feeding.

[1] N. Kopeloff: Lactobacillus Acidophilus. Baltimore: Williams and Wilkins Company. 1926. 22*s*. 6*d*.
[2] Jour. Amer. Med. Assoc., July 17th, p. 139.

RESEARCH IN BREEDING ANIMALS.—The Rockefeller Foundation has offered £30,000 for the extension of the Animal Breeding Research Department at Edinburgh on condition that an equal sum is raised in this country. The International Education Board is said to have come to the conclusion that this department, which is under the joint management of the East of Scotland College of Agriculture and the University of Edinburgh, is the best centre in the world for training in agricultural genetics. The donation is offered so that it may be able to provide for the training of students from all parts of the world. The department is under the direction of Dr. F. A. E. Crewe, and during the past year courses of lectures have been given by members of the staff to students of agriculture and veterinary science at many centres in England and Scotland.

Annotations.

"Ne quid nimis."

PRACTITIONERS AND DANGEROUS DRUGS.

EFFECT has now been given to the recommendation, made by the Departmental Committee on Morphine and Heroin Addiction, that a medical tribunal should be set up to consider the case of medical practitioners addicted to drugs or supplying them for purposes of addiction. As already foreshadowed,[1] this tribunal is to consist of three medical practitioners, assisted by a legal assessor, and as from July 29th last the Home Secretary is no longer obliged to chase an offending doctor into the police-court in order to obtain the withdrawal of his authority to supply and possess habit-forming drugs. It was the feeling of the Departmental Committee that a tribunal with a strong medical element would serve the double purpose of protecting from himself a doctor who had unfortunately become a drug addict and protecting his patients by preventing him from prescribing dangerous drugs in excess. The new Regulations will achieve this purpose and at the same time avoid unseemly publicity in a distressing but happily very small class of cases. The other Regulations which came into force on the same date make it an offence for a person to go to a second doctor for a supply or prescription of habit-forming drugs unless he first discloses that he has been receiving treatment from another practitioner. Doctors, dentists, and veterinary surgeons are now required to keep records of all supplies of dangerous drugs purchased or obtained by them, whether or not they dispense or otherwise supply the drugs. Copies of these Regulations, amending the Dangerous Drug Regulations of 1921, are obtainable from H.M. Stationery Office.

GASTROSCOPY.

THERE is significance in the fact that endoscopic examination of the stomach was being attempted in London before the war, whereas to-day the practice is so rare as to be almost unknown. The difficulties and dangers of the procedure have caused it to fall into abeyance. Nevertheless, it is still employed quite frequently both in Germany and in Austria, and it seems clear that if it could be brought to a more perfect state of technique it would be of the utmost importance both in diagnosis and for watching the effects of treatment. When we realise the immense issues determined by the examination of an X ray shadow the potential value of a direct view of the gastric mucosa is apparent. Stimulated by such views Dr. Jean Rachet,[2] working with Dr. Bensaude at the Hôpital Saint-Antoine in Paris, has recently published a study of his clinical and experimental observations with this instrument. The modesty and logic of his conclusions are such that we feel them worthy of reproduction here. Gastroscopy must remain an exceptional method of gastric examination; it occupies a position in the means at our disposal after radiographic examination but before laparotomy. Gastroscopy demands the exercise of the greatest prudence, the greatest patience, and the greatest gentleness. The method cannot be looked upon as an everyday means of investigation and should remain in the hands of experts trained in its use. The safety of its employment must not be sacrificed even for the benefit of progress. It is impossible with a gastroscope to explore the whole of the stomach and consequently a negative finding does not permit of the exclusion of organic disease. A straight, rigid gastroscope for indirect vision is advocated by Dr. Rachet, and he insists on the importance of scrupulous preliminary examination of the patient. The passage of the instrument is made with the patient in the position of left lateral decubitus, local anæsthesia is employed, and a guiding thread is first swallowed by the patient. After detailing the technique necessary to obtain an adequate view of the greater part of the stomach, the author points out the value of the method for studying recent peptic ulcers and for identifying early malignant growths. As regards the latter, he notes the disappointment that must result from the fact that patients experience symptoms so late that even by the most accurate means of diagnosis early cancer will rarely be discovered. In the study of true gastritis the instrument holds out hope of progress in our knowledge, for it is only when direct vision is added to our armamentarium that we can hope for any real advance concerning this disease. "Gastroscopy," Dr. Rachet concludes, "appears to be a method promising rich results; but it requires great prudence and much further research to establish its final value. It should in no case supplant other means of investigation, and it is by the accumulation of clinical facts that it will acquire its right to be quoted as a first-class means of examining cases of digestive disturbance."

MEDIÆVAL MEDICINE.

AN excellent epitome has been made from the four volumes already published of Mr. R. T. Gunther's larger work, "Early Science in Oxford," in order that a large number of students for whom the cost of the original book was prohibitive may have an opportunity of studying some of the subjects therein mentioned. The present work[1] is in seven chapters dealing respectively with Early Medicine, Medicine in the Seventeenth Century and After, Anatomy, Physiology, Zoology, Botany, and Geology. The book is of a size handy to read, admirably printed, has many illustrations, and is altogether delightful. Mr. Gunther has a wonderful flair for extracting gems from the various ancient mines in which he has been working, and many of them show how true is the aphorism that there is nothing new under the sun. For instance, the following excerpt, taken from the diaries of one Simon Forman (1552–1611), of Magdalen College, puts modern professors of rejuvenation in the shade: "and myselfe did boill 2 snakes in my strong water when I distilled it and after I drank of that water and yt made me to be fresh and take away all my gray hairs when I was 56 yers old and many toke me not to be above 40 or 42." Another would, if he reads it, make Sir Arthur Conan Doyle extremely envious. It concerns a Fellow of Trinity, by name Th. Allen (1542–1632), noted for his skill in mathematics and astrology. The vulgar looked upon him as a magician and his servitor would tell them "that he met the spirits coming up the stairs like bees." Few outside the medical profession, or we might even say within it, know that the architect of St. Paul's was the same Dr. Christopher Wren, Fellow of All Souls, to whom are due the beautiful anatomical drawings in illustration of Willis's work on the brain, and that he was also the originator of intravenous injections. The discovery of a method of injecting bodies with a solidifying fluid is due to Boyle, as also the method of keeping moist anatomical preparations in spirit. Richard Lower, a pupil of Willis, studied the anatomy of the heart (1669) and left some accurate drawings showing the spiral arrangement of the muscular fibres, a fact almost forgotten until its revival by Pettigrew. Robert Hooke, of Christ Church (1635–1702), who was not only a skilled microscopist but an architect of no mean talents (he built the new buildings of Bethlehem Hospital in 1675), was the first to record that the blue colour in a peacock's tail has no real existence, but is due to "a texture visible under the microscope"—i.e., is due to interference, though,

[1] THE LANCET, June 19th, p. 1218.

[2] La Gastroscopie. By Dr. Jean Rachet. Paris: Octave Doin. 1926. Pp. 117. Fr.20.

[1] Early Medical and Biological Science; extracted from Early Science in Oxford, by R. T. Gunther, M.A., LL.D. Oxford University Press, Humphrey Milford. 1926. Pp. 246. 7s. 6d.

of course, he did not know the reason. These quotations may suffice to indicate the interest of Mr. Gunther's book. Of the series of postcards issuing from the same press,[2] two especially are worthy of note; the one (dated 1631) shows the Castle of Health attacked by flying evils, an early forecast of microbial invasion; the other (dated 1660) is an amputation scene from a window in the Bodleian. The patient is seated in a chair placidly regarding the operator, who is removing his leg with a hack-saw, no preliminary incision of the soft parts having apparently been made.

THE ACTION OF PITUITARY EXTRACT ON THE UTERUS.

IN 1924 Dixon and Marshall[3] showed the existence of a relation between the cyclic activity of the ovary and the pituitary gland, and stated that the amount of pituitary secretion discharged into the cerebro-spinal fluid depends largely upon whether corpora lutea are present or absent. They came to the conclusion that as the corpus luteum is supposed to undergo retrogression shortly before the close of pregnancy, the revival of the ovarian secretion causes a sudden increase of pituitary secretion, which by its action on the more irritable uterine muscle brings about labour. According to this theory the increase of pituitary secretion is an important factor in starting parturition. Subsequent observers, in studying the conduction of contractions in uterine muscle, found that there are distinct changes in the mechanism of this muscle at different stages of the œstrous cycle. It was also found that remarkable changes take place under the action of pituitary extract, which seems to induce the same effect in the uterus at the dioestrous period as that which occurs naturally at œstrus and during early pregnancy. In order to test the view that a steady or sudden increase of pituitary secretion at the end of pregnancy finally brings about labour, H. H. Knaus[4] has now reported on his further results obtained from injecting standardised pituitary extract into doe rabbits at various stages of pregnancy. The duration of pregnancy in these animals is 31–32 days. It was found possible to induce parturition by injecting a certain quantity of pituitary at any time after the twenty-ninth day of pregnancy. In experiments during the time from the eighteenth to the twenty-eighth day of pregnancy no quantity of pituitary was found sufficient to induce abortion on the day on which the experiment was carried out, but as a result of prolonged pituitary action—nine injections of pituitary were given at hourly intervals—the fœtuses were killed inside the uterus, and were cast some days afterwards. In a group of experiments covering the period from the first to the seventeenth day of pregnancy, no matter what (reasonable) quantity of pituitary extract was injected, it was never found possible to disturb pregnancy. Knaus considers that his results show that considerable changes occur in the relation between the hypophysis and the uterine muscle during pregnancy. An interpretation of the results might apply to one of these organs or to both of them. He concludes that there is no increase of irritability or sensitivity of the uterus during pregnancy, but that, corresponding to the growth of each muscle cell, there is a regular rise of contractility of the muscle. The larger the muscle cell the greater is its ability to shorten itself, and that is why the effect of pituitary extract upon the muscle increases steadily and pregnancy advances. By the twenty-ninth day of pregnancy the uterine muscle cells have grown so large that their maximum contraction, caused by pituitary, results in delivery of the young, while in the last few days of pregnancy the uterus keeps on growing and increasing its contractility, so that eventually a maximum contraction is no longer needed to produce the young.

[2] Old Ashmolean Postcards: Oxford Science Series. Five cards, one in colour, 6d. Oxford University Press.
[3] Journal of Physiology, lix., 276.
[4] Ibid., June, 1926.

RESPIRATORY ARCHIVES.

THE first number of a new journal entitled *Archives Médico-Chirurgicales de l'Appareil Respiratoire* has just reached us, founded by Emile Sergent and Th. Tuffier, its object being to collate the work of physiologists, physicians, and surgeons in its bearing on the pathology of the respiratory system. The founders hold that recent knowledge of the physiology of the chest and precision in technique have given a fruitful stimulus to the clinical study of respiratory diseases and have contributed largely to the development of new clinical methods. Artificial pneumothorax, phrenicectomy, and extrapleural thoracoplasty enable the physician to-day to contend against lesions thought, until recently, to be almost incurable. Excision and destruction by cautery of lobes of the lung involved by suppurations or by tuberculosis are no longer considered in the light of forlorn hopes. Each number of the journal (about 100 pages) is to comprise three parts, the first to be reserved for original contributions, the second for critical reviews, and the third for a digest of the principal papers published in France or abroad. The *Archives* will appear at two-monthly intervals, the cost in England per volume of six numbers being 130 francs. The publishers are Gaston Doin et Cie, Paris.

The first number opens with an article by E. Sergent on the interpretation of respiratory murmurs, in which he pleads for recognition of the fact that a pathological breath sound is not something adventitious or superimposed, as are râles and friction sounds, but is none other than the physiological laryngo-tracheal sound, transmitted by some pathological cause beyond those regions over which it is normally perceived and modified in its acoustic properties by the physical conditions associated with the pathological cause. In the second original article Th. Tuffier, to whom every credit is due for the origination of this method, deals with extrapleural pneumolysis which he has himself carried out 57 times in 55 subjects, 44 of whom were suffering from pulmonary tuberculosis. He used fat grafts in 33 cases, paraffin in 8 cases. At first sight his results appear happier than those obtained by other surgeons, but many of his observations are of short duration. For example, while one case was seen eight years and another two years after operation, and both had done well, in 11 other cases of pulmonary tuberculosis reported as satisfactory an opinion was based on examinations made less than five months after operation. The results in cases other than tubercle were less satisfactory. Phrenicectomy is the subject chosen for critical review. F. Bordet discusses the results obtained in cases (1) of pulmonary tuberculosis, (2) of bronchiectasis, (3) of chronic basal suppurations. In the first group the scope of the operation as a curative measure is very limited, although in Germany, Italy, and America improvement has been claimed in a number of cases. As a preliminary to thoracoplasty, and in association with artificial pneumothorax, phrenicectomy is gaining adherents. The curative value of phrenicectomy as the sole procedure in the treatment of bronchiectasis is regarded as doubtful, though there have been exceptional cases. A. Baumgartner and P. Alary deal with the possible variations in origin and course of the phrenic and accessory phrenic nerves. They favour the operation of evulsion (exeresis) over the radical operation of Goetze, except in cases where difficulties arise, and particularly when there is pleural effusion. They do not discuss the difficulties caused by pain and transmitted pulsation during evulsion, which are very real to those who have had experience of the operation. It is surely optimistic to state "When one has resected 7 or 8 cm. of the phrenic at the base of the neck one can consider that the anastomoses have been destroyed."

The journal has been modelled on the well-known *Journal de Chirurgie*, and the idea and its execution

are both excellent. It remains to be seen whether sufficient material can be produced in one country to maintain the output at a high standard.

A SEPTEMBER POST-GRADUATE COURSE FOR PRACTITIONERS.

A COURSE of instruction for qualified practitioners will be given at St. Bartholomew's Hospital during the summer vacation, beginning Monday, Sept. 6th, and ending Saturday, Sept. 18th. The object in view is to afford practitioners the opportunity of attending the practice of a large metropolitan hospital and medical college for a short period and of receiving systematic teaching from members of the hospital staff at a time when ordinary lectures and classes are in abeyance and comparatively few students are in attendance. The course includes the usual rounds of the physicians, surgeons, and specialists on the hospital staff, as well as demonstrations in the wards and in the out-patient departments. There will also be a series of special demonstrations on such things as the clinical significance of gastric secretion, carcinoma of the tongue, amputations in relation to artificial limb-fitting, the diagnosis and treatment of chronic sepsis of the lung and pleura, infections of the urinary tract, sanocrysin in pulmonary tuberculosis, artificial sunlight in general medicine, and regional and local anæsthesia. Practitioners attending the post-graduate course become temporary honorary members of the Students' Union and have the use of the Abernethian smoking and writing rooms and of the dining room. The composition fee for the whole course is 10 guineas, reduced to 8 guineas for practitioners who are perpetual students of the hospital, while either week of the course may be taken for the fee of 6 guineas (5 guineas). Every practitioner who enters for a course is required to call on the Dean and to sign the hospital register. Application should be made to the Dean, Dr. T. W. Shore, St. Bartholomew's Hospital Medical College, London, E.C. 4.

A NEW DUST TRAP FOR ROCK DRILLING.

THE introduction of the percussive or pneumatic drill for carving granite and for boring holes in rocks into which explosive charges are inserted has added greatly to the dust danger of granite workers and miners, more particularly when the rocks contain silica, as in the case of granites and many metalliferous lodes. Many efforts have been made in the past to control the escape of the dust by the use of water either through hollow drills or by sprays, but they have proved little more than palliatives, and the incidence of silicosis has gone pari passu with increased use of the drills. Now, however, the welcome announcement is made from the Mines Department of an ingenious device for trapping the dust as it is formed.[1] It is sucked away from the place where the drill enters the rock by an exhaust draught which is actuated by spent air escaping from the drill. This air is made to pass off by a nozzle placed within a larger pipe when, on the ejector principle, it induces a considerable suction of air into the pipe. The more the drill works, the more does spent air escape to induce a greater exhaust draught for catching the dust, since the pipe is made to open where the tool is at work. The exhaust draught carrying the dust is discharged into a flannel trouser, the bottom of which fits on to an open metal box. The air escapes readily through the flannel leaving the particles of dust behind. These particles are automatically shaken off the flannel down into the box by the pulsating nature of the exhaust draught due to successive puffs of spent air escaping from the machine drill. The device only comes into play when the drill is in action and makes use of semi-compressed air which was otherwise wasted. For catching dust when holes are being blown out the ejector nozzle is attached direct to the compressed air supply. The efficiency of the device has been demonstrated by comparative dust counts which indicated from 58 to 198 dust particles per cubic centimetre of air with no work in progress, over 2000 particles (too many to count) with the drill at work without the device, and 163 to 332 with the device attached. In the South African gold mines the standard of safety adopted for dust concentration is 300 particles per cubic centimetre of air. This device may confidently be expected to save many lives from silicosis, and to go far towards banishing from the rock-drill the insidious and terrible risk which has always been associated with its use.

[1] A Method of Trapping the Dust Produced by Pneumatic Rock Drills. By P. S. Hay. Safety in Mines Research Board, Paper No. 23. H.M. Stationery Office. 1926. 6d.

IN DEFENCE OF THE TOOTH-BRUSH.

IN the *Scalpel* of July 10th Dr. F. Watry combats the indictment of the tooth-brush by Dr. M. Polet in a recent number of the *Annales de l'Institut Chirurgical de Bruxelles*. Dr. Polet accused the tooth-brush of being a cause of dental caries, gum trouble, and pyorrhœa, and would have us trust instead to thorough mastication, fruits especially apples and fibrous roots at the end of a meal, and rinsing of the mouth. He also advocates the use of liquorice root as a substitute for the tooth-brush. Dr. Watry claims, on the other hand, that the tooth-brush is invaluable as a weapon of oral prophylaxis, and that the harm is done by badly constructed tooth-brushes, generally dirty, and used in the wrong way. Very few people, he says, have such perfect mouths as to justify dispensing with the tooth-brush. The brush should have a light impermeable handle and the bristles should be arranged so that they will clean the dental interspaces and so that they can be readily cleaned and disinfected by allowing water or disinfectant vapour to get between and around them. The brush should be suited to the individual mouth and, if possible, chosen by a specialist. It should be disinfected before its first use and cleaned and sterilised after each subsequent use. Boiling is not possible but formalin vapour may be used. Dr. Watry admits that among the masses one will have to be content with careful washing and keeping in a clean place. Before using the brush the mouth should be thoroughly rinsed and gargled. The brushing should be vertical, from below upwards for the upper jaw, from above downwards for the lower jaw with an energy suited to the tone of the tissues, so as not to cause bleeding. Thorough rinsing and gargling should follow the brushing. It is a good plan to follow the brushing by the use of a thread to clear the interdental spaces. Some experts also recommend massage of the gums with the fingers. These rules do not apply to mouths in a pathological or inflammatory condition, in which event medical advice should be sought.

There is no reason to apprehend trouble owing to the moving of the buccal flora from one part of the mouth to another by a clean brush. The substitution of liquorice root for the tooth-brush cannot be considered an advance. Dr. Polet's paper, says Dr. Watry, will serve a useful purpose by drawing attention to the abuse and clumsy use of the tooth-brush. Dr. Watry reminds us that the International Dental Federation, under the presidency of Prof. Brophy, of Chicago, instituted more than a year ago a thorough inquiry into the question of the tooth-brush. The special committee appointed to conduct the investigation has not issued its final report but it made a provisional report to the Federation at the Geneva meeting of 1925. The provisional report confirms the value of the tooth-brush and attributes the harm imputed to it to its wrong use or to the use of unsuitable brushes, and attaches great importance to the education of the public as to the proper construction and use of tooth-brushes. The committee also proposes to go fully into the question of the alleged harm done by tooth-brushes, however small it may be.

LIGHT AND VITAMINS.

LIGHT is gradually being shed on the nature of the vitamins by the agent itself. It has already been shown by Hess and Weinstock that vitamin D is a photosynthetic body, being, in fact, built up by the action of light on cholesterol, and the observation has more recently been confirmed by Steenbock. In an interesting note from the Middlesex Hospital by Dr. P. R. Peacock, which we publish this week, it is shown that vitamin A is photolabile—that is to say, it is destroyed by light, provided that the light is of sufficient intensity. Dr. Peacock noticed that cod-liver oil lost its fluorescence when exposed to light for months on the working bench, and he set himself to discover whether its "delumination," as he calls it, bore any relation to the vitamin content of the oil. He soon found that the deluminated oil failed to show the usual chemical test for the presence of vitamin A, but on following the matter up he discovered that delumination and destruction of this vitamin were parallel but not identical phenomena, since fully deluminated oil recovered its fluorescence when kept in the dark, although the colour test for vitamin A failed to return. On the other hand, he found no evidence to suggest that the antirachitic vitamin D in cod-liver oil is destroyed by sunlight. Light, he concludes, is thus a variable factor which must be taken into account in estimating the growth-promoting properties of cod-liver oil, and attention must be paid to the manner in which the oil is stored. While the essential chemical nature of the vitamins still remains obscure, observations such as those of Dr. Peacock may serve to indicate into what categories they fall, and even to suggest types of molecular stability. There are apparently two changes in the absorption spectrum of cod-liver oil after exposure to light, one corresponding to the destruction of vitamin A and the other indicating a chemico-physical change of a reversible character. Such reversible changes initiated by light are on our present knowledge extremely rare, and it would be premature to state definitely that the changes observed are purely chemical in character. Further researches on this point would be of great interest.

HERITABLE HYPERGLYCÆMIA.

WHEN hygiene begins to take eugenics seriously it will have no task more important than the identification of heritable characters and their modes of grouping and inheritance. A knowledge of the possibilities and what is worth looking for in man must almost necessarily be derived from the study of some shorter-lived animal; the valiant contributions which thousands of mice have made to our knowledge of cancer before they died of old age, at about 2, have been extraordinarily useful, and it is in these same handy animals that Dr. P. J. Cammidge and Mr. H. A. H. Howard have made some highly suggestive observations on blood-sugar.[1] In the ordinary run of mice the fasting concentration of blood-sugar is about 85 ±5 mg. per 100 c.cm. A certain number show, however, substantially higher figures, ranging round 120 mg., and if these are bred together all the progeny have hyperglycæmia too. Further appropriate matings showed that high blood-sugar is inherited in a straightforward way as a Mendelian recessive character and the results of crossing high with low and low with low depended on the genetical constitution of the animals exhibiting the dominant low character. Incidentally, the breeding experiments involved albinism—another recessive character—as well, and they show that the two are inherited independently of one another. It will be of much interest to see whether these results apply also to man; they probably do. Published collections of normal blood-sugar figures by H. Gray[2] show a distribution of values in a tolerably normal curve without any suggestion of two modes. But recessive characters are shy and especially if they involve a greater liability to death or a lesser likelihood of reproduction than normal, they may be obviously present only in a very small proportion of the population, as, for example, is feeble-mindedness. What relation hyperglycæmia has to diabetes is uncertain. It seems extremely probable that diabetes is usually caused by the wearing out by overwork of a congenitally weak mechanism for disposing of carbohydrates. Hyperglycæmia is naturally an early symptom, but it cannot at present be affirmed that it is causally related to actual diabetes. A heritable factor has been involved in the ætiology, as indeed it has in most diseases of which the cause is not known, but definite evidence is lacking, though diabetes insipidus is sometimes clearly inherited. Those who doubt the hygienic importance of tracing out as diligently as it can be done the facts of human inheritance should study the memoir on the relative factors influencing infant welfare by Dr. Ethel Elderton which is appearing in the *Annals of Eugenics*. Poverty, housing, and sanitation have little effect on infant mortality, compared with the influence of the father's health and habits and especially of the health of the mother. Whether health and habits cause environment or vice versa is as yet unsolved, but the general impression given by Dr. Elderton's work, expressed in terms less guarded than her own, is that the nature of the people concerned is more important than their surroundings and that their nature is inborn. Parallel results are recorded by Prof. Noël Paton and Prof. Leonard Findlay in their report on Poverty, Nutrition, and Growth, reviewed in THE LANCET, July 31st, p. 240. In this report similar emphasis is laid on hereditary as opposed to environmental factors as influencing the growth of children in slums.

[1] Jour. Genetics, 1926, xvi., 387.
[2] Arch. Int. Med., 1923, xxxi., 241.

WE regret to learn of the death of Dr. Robert Henry Cole, physician for mental diseases to St. Mary's Hospital and last year's President of the Section of Psychiatry of the Royal Society of Medicine. Dr. Cole succumbed on Tuesday last to an attack of angina pectoris.

AN Order of Council has been issued altering the composition of the Committee of Privy Council for Medical Research, the ministerial body under which the Medical Research Council conduct their work. The Committee originally consisted of the Lord President of the Council, the Minister of Health (England and Wales), the Secretary for Scotland, and the Chief Secretary for Ireland, but the last-named office has become obsolete as a result of the changes in the government of Ireland. In view of this vacancy, and of the increasing relation of the Medical Research Council to research work in overseas parts of the Empire and in industrial medicine, the Secretaries of State for Home Affairs, for Dominion Affairs, and for the Colonies have now been added to the Committee.

INDEX TO "THE LANCET," VOL. I., 1926.

THE Index and Title-page to Vol. I., 1926, which was completed with the issue of June 26th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

METROPOLITAN ASYLUMS BOARD.—A three months' course in hospital administration is to be held, for the benefit of candidates for the Diploma of Public Health, at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N., by the medical superintendent, Dr. F. H. Thomson. The lectures will be given on Mondays and Wednesdays at 4.45 P.M., and on alternate Saturdays at 11 A.M., and will begin on Oct. 4th. Application should be made to the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLXXXV.

THE TREATMENT OF ANKYLOSTOMIASIS.

FOR all practical purposes human ankylostomiasis may be defined as the sum of the effects of infestation with *Necator americanus* and *Ancylostoma duodenale*, one or both. Its treatment consists, first, in the poisoning and expulsion of all hookworms; and, secondly, in the counteracting of the ill-effects, particularly the anæmia, which they have produced.

The ideal anthelmintic would, in a single dose, kill all hookworms without endangering the host. No such drug is known. Accordingly, the dose of an anthelmintic drug is a compromise between efficiency and safety. Safety is mainly determined by the size of the dose; efficiency is presumably dependent upon the amount of the drug which comes into contact with the worms—that is to say, upon its concentration in the intestine—provided this be maintained for an adequate period.

With a view to intensifying this concentration it has become an established practice that, before giving an anthelmintic, the bulk of the intestinal contents shall be reduced by preliminary fasting and purgation. It will, however, be seen presently that this accepted procedure may be dangerous. It is a common practice to administer the anthelmintic in two or three equal fractions, generally at hourly intervals and in the early morning. Subdivision presumably lessens the intestinal concentration, but may increase the period over which the drug is present there in a degree poisonous to hookworms. It is further the practice to give a purgative with or after the anthelmintic, with the twofold object of eliminating the residue of the drug, thus lessening unwanted absorption by the host, and of removing the worms before they can either reattach themselves to the intestinal mucosa—should the poisoning be temporary and not fatal—or damage the host by absorption of any toxins which may be liberated by their dissolution. The purgative commonly takes the form of 16 to 32 g. of sulphate of soda or magnesia an hour after the last dose of anthelmintic.

Five Lines of Treatment.

Various lines of treatment have been advised for ankylostomiasis; of these five have obtained a vogue. They are—chloroform and eucalyptus, beta-naphthol, thymol, oil of chenopodium or its active principle, ascaridol, and carbon tetrachloride. Their anthelmintic value has been estimated (1) by post-treatment examination of the stools for ova (either crudely, for their presence at all, or accurately—and rarely—for the degree of their diminution in a unit quantity of solid fæces), or (2) by determining the percentage of worms expelled by any treatment compared with the total number expelled, both by the treatment under test and by a second treatment with a drug believed to be reasonably effective. The last year or two have shown that, as ordinarily carried out, both these tests are inaccurate. Accordingly, our knowledge of the efficiency of all lines of treatment is much less exact than it can, and it is hoped will, be made during the next few years, if what appear to be reliable forms of control are more widely adopted. Regarding the lines of treatment mentioned above, the position is as follows:—

Oil of Eucalyptus and Chloroform.—This treatment, at one time popular, consists of oil of eucalyptus 2·5 c.cm., chloroform 3·5 c.cm., castor oil 40 c.cm. The consequent symptoms have so often been provocative of anxiety that it now finds no advocates, at least for mass treatment.

Beta-naphthol, taken in excess, gives rise to vomiting and marked destruction of erythrocytes with the usual concomitants—namely, jaundice with hæmaturia or albuminuria—followed, it may be, by death. Such fatal consequences have been produced by a dose as small as 4 g. (R. Howard). Two deaths and a number of anxious cases have been produced among about 1000 persons taking an ordered dosage of 50 gr. (3·6 g.), the officer responsible questioning, however, whether they had received even as much as this. The drug in this instance was reported as being chemically pure. The optimum dose has been taken as 2 g.; but even in this dosage there is clearly blood destruction since, as Ashford and Igaravidez have shown, it is invariably accompanied by the appearance of the diazo-reaction in the urine. As regards efficiency R. Howard, using the crude diagnostic methods available in 1918, reported that 9, 12, or more doses of 3 to 4 g. were required to disinfest. The best reported results appear to have been obtained by Ashford and Igaravidez, who continued treatment, with search of the stools for worms, so long as any were recovered. Of the total so found, 72 per cent. were recovered after the first treatment. In about 1000 cases similarly treated in India in 1916, and using the crude diagnostic methods then available, I found 25 per cent. still showing ova after five treatments.

Thymol has had a wide use in the treatment of ankylostomiasis. Its optimum dose is 60 gr. There seems to be no record of death with certainty attributable to thymol taken in optimum dosage. Vomiting, dizziness, and tinglings may be experienced. Including treatments and re-treatments, the writer gave about 50,000 optimum doses of this drug to some 20,000 persons in Darjeeling, India, without mortality or serious anxiety. It is the drug with the best record for safety. Regarding efficiency, Ashford and Igaravidez, using the methods already indicated, obtained from the first treatment 77 per cent. of the total worms recovered. It is thus somewhat more efficacious than beta-naphthol, but is more expensive. In the doses suggested as optimum, thymol produced no destruction of erythrocytes. It is apt to ball when given in powder form, considerable masses being found unchanged in the fæces. This wastefulness can be prevented by using powdered thymol and mixing it intimately with an equal quantity of sugar of milk, or the cheaper bicarbonate of soda, the kind of "adulterant" used being perhaps immaterial provided it mechanically separate the thymol crystals. Judged by the crude diagnostic methods available in Trinidad in 1915, this "adulteration" raised the cure rate after one treatment from 12 per cent. to 48 per cent. Thymol is soluble in alcohol and in oil. To avoid unnecessary risk of absorption these should be interdicted during treatment, the final purge not being castor oil.

Oil of Chenopodium.—The optimum dose of this oil was originally placed by Schüffner and Vernoort at about 48 drops, as furnished by the International Drop Counter, a total equivalent to about 1·2 c.cm. The measure has been misunderstood and the drop held equivalent to a minim, so that the dosage widely used has been 3 c.cm.; and a number of deaths have followed. The toxic symptoms produced are epigastric heat, colic, nausea and vomiting, paræsthesiæ of all senses, weakness, incoördination and spasm, confusion, delirium, coma, and convulsions. Unaware of the actual position the experience of Darling and others reduced the dosage to 1·5 c.cm., which approximates to that from which Schüffner and Vervoort had never deviated. There seem to be no adequate figures available for the comparison of thymol and oil of chenopodium in their optimum doses. Darling compared 4 g. of thymol with 1·5 c.cm. of oil of chenopodium, and obtained relative efficiencies of 88·6 and 95·7 per cent. With the oil given in dosage of 1·2 c.cm. there is likely to be little to choose between the two drugs in efficiency or risk, and for mass work the choice will depend on convenience and cheapness of purchase and administration. This statement applies to

N. americanus. For *A. duodenale* chenopodium appears to be the more effective drug. Its active principle, ascaridol, was found by Nelson to comprise 50 to 70 per cent. of the oil, and it has been stated that, on keeping, the drug loses in efficiency and gains in toxicity. When given mixed with castor oil it is less efficacious than when the purgative follows.

Carbon Tetrachloride, the popular anthelmintic of the hour, was introduced by Maurice C. Hall in 1921 in dosage of 3 c.cm. With this dose its efficacy is marked; and a number of deaths have occurred. It seems definitely established that the chemically pure drug in this dose may kill with entire unexpectedness. The main lesions produced are fatty degeneration, with a subsequent necrosis, greatly aggravated by fasting, of liver and kidneys—regeneration, particularly in the former organ, being very rapid. Symptoms of poisoning include early nausea, vomiting, and epigastric pain, hepatic tenderness, jaundice, hæmaturia, and temporary suppression of urine. Hall and Cram point out that almost all deaths have followed what they call "therapeutic doses," and conclude that the drug has no minimum lethal dose. I would put the matter otherwise and suggest that the accepted is neither a therapeutic, nor the optimum, dose. Regarding a smaller dose, Smillie and Pessoa treated 15 cases with 1·5 c.cm. of the drug in two doses, and estimated that 62 per cent. of worms were removed and 12·5 per cent. of persons disinfested. Even with this lessened dose one of their cases became gravely ill, with vomiting, much bile in the urine, and a temperature of 104° F. Straub and Kouwenaar, after 16 deaths with dosage from 1·5 to 3 c.cm., disallow treatment by this drug. The drug may then kill with unexpectedness in doses of 1·5 c.cm., in which dose it is less effective than are the older anthelmintics. Preliminary fasting increases risk of poisoning, as does ingestion of fats; glucose lessens it.

Carbon Tetrachloride Combined with Oil of Chenopodium or Ascaridol.—A combination of these drugs has latterly been used in the hope that, their toxic effects falling largely upon different systems, the combination will be more effective than would either drug be separately, while toxicity will not be materially increased. The efficacy of this combination merits, and will no doubt receive, a properly controlled trial.

Conclusion.

From these considerations the following conclusions naturally emerge. If one place safety first, and there is surely no possible justification for any other general attitude on the part of a medical man, carbon tetrachloride, in advised doses, does not occupy the premier position which is claimed for it; nor for analogous reasons is beta-naphthol a drug which can be recommended. Thymol, and oil of chenopodium of known ascaridol content, used in respective dosage of 4 g. and 1·2 c.cm., are safe drugs, the latter being, apparently, the more effective where *A. duodenale* is concerned. The choice between the two will mainly be determined by secondary considerations, such as palatability and, under mass conditions, ease and cost of administration. Medicinal iron is of little or no value in the persistent presence of hookworms. After their expulsion it will be used as in any other anæmia whose cause has been removed, and there is evidence that arsenic may aid the bone-marrow in the formation of hæmoglobin. The solution of the immense and important problem of eradicating ankylostome infestation, so far as it depends upon mass treatment, can only be effected by the discovery of some drug more specific in its toxicity to hookworms than any now known. The search for such a drug, checked step by step by adequate controls, is one of the most urgent matters for those who are concerned for the health of several hundreds of millions of the more humble dwellers in the tropics.

CLAYTON LANE, M.D. Lond.,
Lieut.-Colonel, Indian Medical Service (retd.).

Special Articles.

THE HEALTH OF LONDON IN 1925.

Dr. F. N. K. Menzies presents the public health report which has been prepared in collaboration with Sir William Hamer, who was medical officer until the end of 1925. The report opens with a retrospect of public health effort in London since the appointment of the late Sir Shirley Murphy in 1890, and comparison is made with the survey of the same period made by the late Dr. James Niven on his retirement from the post of medical officer of health of Manchester. There were many differences to record. For example, London at the beginning of the period was already a water-carriage town, while Manchester had to grapple with the difficulties of middens, privies, and the pail system; on the other hand, Manchester had an unexceptionable water-supply, while London has had to put the finishing touches to that problem during the last three decades, and has done the work on quite different lines from those of Manchester. In both surveys great importance is attached to the removal of filth whether without or within the habitations of the people, and both Murphy and Niven laid great stress on good systems of investigation of disease.

Improved Environment.

In the present survey details are given to indicate the wonderful improvement in the environment of the Londoner. The part played by education and more recently by the medical inspection and treatment of the school-children is emphasised, and the following extract gives some idea of the change.

> Any observer who is old enough can recall the appearance of the poorer London children half a century ago, when the London School Board was only just beginning to make its influence felt; in the days of unregulated child labour, of boy bootblacks and child crossing sweepers; the days of "ragged schools," when bare feet were the rule, and frost-bite, ophthalmia, running ears, enlarged glands resulting from skin infestation, malnutrition, and deformities were only too common; and particularly any medical observer, familiar with the vermin-infested rooms of his midwifery experiences in the slums of London, or with the sight of the skins of children in out-patient departments, many of which were peppered with hundreds of flea marks; such an one, if he will stand and look at the scholars trooping into school nowadays will realise that the main cause of improved sickness and mortality statistics among the child population in the London of to-day is to be found in the heightened sense of parental responsibility, aroused in a generation of parents who have themselves passed through the schools.

The estimated population of the County of London for 1925 was 4,612,000. The birth-rate was 17·9, the death-rate 11·9, and the infant mortality-rate 68. The death-rate from phthisis was 0·95, from pneumonia 1·04, from bronchitis 0·9, and from cancer 1·44. The rates varied considerably in the 29 boroughs which make up the County of London. Thus, excluding the small peculiar population of the City, the highest birth-rates were in Shoreditch 24·5, in Poplar 22·7, and in Bermondsey 22·6, while the lowest were recorded in Westminster 10·7 and in Holborn and Hampstead 12·2. Lewisham had the lowest death-rate, 10·4, while Hampstead, Battersea, and Wandsworth scored a dead heat for second place with 10·5. Fulham came next with 10·7 and then Woolwich with 10·8. The highest death-rate was recorded in Chelsea, 13·7; Finsbury was next with 13·5, and Kensington, Shoreditch, and Southwark were equal third with 13·2. Wandsworth had the lowest infant mortality-rate, 54. Woolwich and Hampstead were second with 55, Lewisham had a rate of 56, and Battersea 58. The highest infant mortality-rate occurred in Shoreditch, 88; in Bethnal Green the rate was 81, in Kensington 79, and in Southwark 78, while Stepney, Poplar, and Bermondsey each had a rate of 76. The lowest phthisis rates were found in Hampstead, Lewisham, and Paddington, 0·59, 0·64, and 0·65 respectively, while the highest phthisis-rates were in Finsbury 1·42

Stepney 1·26, Shoreditch 1·19, Bermondsey 1·17, and Woolwich 1·14.

The lowest rates for pneumonia were recorded in Wandsworth 0·56, Battersea 0·62, and Hampstead 0·66, while the highest were in Bermondsey 1·59, Poplar 1·55, and Shoreditch 1·37. The lowest rates from cancer occurred in Shoreditch 1·13, Poplar 1·15, Greenwich 1·23, and Stepney 1·24, while the highest were in Chelsea 2·02, Kensington and Westminster each 1·76, and Islington 1·62.

Changing Death-rates.—Cancer, Small-pox, Influenza.

A chart shows the changes in the rates for marriages, births, deaths, and infant mortality since 1840. Up to 1875 the marriage-rate was usually well over the mean figure of 19 and averaged over 20. Since 1875 it has usually been well below 19, but reached the figure of 19 in 1898, rose to 26 in the second year of the war, and was over 22 and 21 respectively in the post-war years of 1920 and 1921. The contour for the birth-rate remained above the mean figure of 30·5 until 1895, since which year there has been a steady decline interrupted by the post-war rise in 1920. The contour line for the death-rate has been below the mean figure of 20·2 since 1895, and has declined steadily since that date except for temporary rises in 1915 and the influenza year of 1918. The infant mortality-rate, unlike the last two, has only been permanently below the mean line since 1905. The average before that date was well over 150 and the decline since that date to the present figure has been very rapid, the chief temporary relapse to a worse state of things being in the hot year of 1911. Another chart shows the contours for groups of diseases and causes of death since 1840. Changes in nomenclature, however, in the classification of causes of death, and in the age and sex constitution of the population make it difficult to draw conclusions from these contours. The authors of the report consider that "the view is still defensible that the increase in the mortality from cancer is very largely, at any rate, accounted for by increase in the population at high ages upon which the maximum mortality falls, and by the great improvement in accuracy of certification." They point out that among females the rate of increase has recently fallen. They also express surprise that in an age which is reputed to be one of "nerve strain," "brain-fag," and "overpressure," diseases of the nervous system make so little impression upon records of mortality as compared with the far away 'sixties and 'seventies.

How wonderfully clear London has kept of small-pox since 1911 is illustrated by a table. The periodicity of influenza is discussed at some length and the conclusion is drawn that forecasts of the coming of influenza epidemics two years ahead cannot be made with accuracy. The following rule is suggested as a guide, likely to prove more reliable than Dr. Brownlee's 33 weeks' periodicity. "When an epidemic of influenza reaches a maximum mortality in the half year between the ninth and thirty-fifth weeks (1) it will recur in the succeeding half year; (2) the two epidemics will, as to the time relation of their mortality maxima, tend to balance about the commencement of the thirty-fifth week of the year." A chart is given to illustrate the balancing of influence epidemics round the thirty-fifth week of the year both in the experience of London and Copenhagen. A table is also given to illustrate the operation of this rule from 1890 to the present date. According to this rule an epidemic should occur about the end of 1926. The epidemiology of typhoid fever in this country and the U.S.A. is considered, from which it would appear that in both countries the influenza of shell-fish was originally masked by the greater prevalence caused by infected water and infected milk, and that the elimination of drinking water infection in this country took place earlier than in the U.S.A. and led to the recognition of shell-fish (and immature ungutted plaice) as a cause of "residual" typhoid at a correspondingly earlier date in Great Britain.

The report from the bacteriological laboratory by Dr. Graham Forbes illustrates how the examination of the cerebro-spinal fluid may aid the differential diagnosis between encephalitis lethargica, tuberculous and other forms of meningitis, and gross cerebral lesions. Dr. Forbes has also studied the rôle of the streptococcus in relation to throat infection and the transmission of puerperal fever and scarlet fever, and the remarkable chain of infection linking together cases of puerperal and scarlet fever recorded by Andrewes and Horder is cited.

Tuberculosis.—Venereal Disease.

A history is given of the building up of the Council's tuberculosis scheme. In June, 1915, the Council adopted a model for the establishment of tuberculosis care committees by the borough councils. Owing to war conditions interim committees had to be appointed to the number of 30. These are being gradually replaced by permanent committees working under the borough councils, and at the present time all the boroughs except four have permanent committees at work. In Islington and Bethnal Green the interim committees continue to function; in Lambeth the care work is carried out by the Lady Almoner's department of St. Thomas's Hospital, and in Bermondsey the arrangement for this work is still in abeyance. The chief duties of these committees are as follow:—

(*a*) The provision of extra nourishment for the family. (*b*) The provision of extra room or extra bed accommodation. (*c*) The provision of an open-air shelter for erection in the patient's garden. (*d*) The removal of the patient to friends or relatives in the country, or the relief of the family by the boarding out of the children and the finding of suitable work for the patient or other members of the family. (*e*) The care of the children and of the home during the absence of the mother and housewife. (*f*) While avoiding anything in the nature of a sanitary inspection, which is carried out by officers of the borough council, the care committee bring to the notice of the public health authority any obvious defects, sanitary or otherwise, requiring investigation.

The present method of selecting cases for residential treatment by clinical medical officers of the staff of the public health department aided by the use of observation beds gives more satisfaction than the methods tried previously. The after-history of the patients who received residential treatment during part of 1914 and during 1915, and of insured persons recommended to sanatorium benefit in 1914, was not encouraging. The number of cases inquired into was 2987. Of these 47 per cent. were early cases, 20 per cent. moderately advanced, and 24 per cent. far advanced cases. Of the early cases 15 per cent., of the moderately advanced 60·1 per cent., and of the far advanced cases 95·5 per cent. are dead.

The need for improving conditions at the venereal disease centres which are likely to cause patients to default in attendance continues to receive careful attention. The ratio of attendances to venereal cases during 1925 reached the very satisfactory proportion of 36 attendances to each new case, and it is claimed that this figure is not only an advance on previous years but compares favourably with the results obtained in countries where venereal diseases are compulsorily notifiable. Another satisfactory feature about the London scheme is the increased use of the facilities for the examination of pathological specimens by medical practitioners. There are now 423 practitioners entitled to free supplies of arsenobenzol preparations as compared with 108 at the end of 1917.

Puerperal Sepsis.

The midwives are supervised by four women medical inspectors, who pay special visits to midwives having cases of a septic nature or persistent high temperature or inflammation of the eyes. There were 316 cases of puerperal fever notified with 78 deaths, but in addition the Registrar-General recorded 26 deaths from puerperal sepsis unnotified during life. About 41,000 confinements were conducted by midwives in independent practice, who summoned medical aid in about 17 per cent. of their cases. In the practice of midwives

there were 422 cases of true ophthalmia neonatorum. Impaired vision in both eyes resulted in one case, in one eye in three cases, whilst in six cases the result could not be ascertained owing to removal. Sixty-five cases received in-patient treatment at St. Margaret's Hospital. As regards beds available in London for maternity cases, it is estimated that about 37,000 patients could be accommodated, equal to 43 per cent. of the total births. Since 1915 the undesirable maternity home has disappeared, whilst the standard of efficiency in other homes has improved.

THE POST-GRADUATE CONGRESS AT BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

THIS year the Hungarian post-graduate medical congress has been held in the neighbourhood of Lake Balaton. Vast tracts of flower forests surround the lake which is so large that it is called the Hungarian Sea, and in the July weather it is an ideal place for a holiday. Those who arranged the course of lectures did their best to make the occasion pleasant as well as useful. The medical teaching was in the mornings only and the afternoons could be given over to bathing, fishing, and excursions. An unprecedented number of doctors came to enjoy this happy mixture of relaxation and learning.

The first lecture was delivered by Prof. John Bokay, who spoke on his experimental results with the Dick prophylactic inoculations against scarlet fever. He had been, he said, one of the first in Europe to try the method, and experience of more than 6000 cases had led to his complete agreement with the Dicks' opinions. He saw the closest reaction between the positive result of the cutaneous test and susceptibility towards scarlet fever, and he regarded the Dick test as of great importance from the point of view of prophylaxis. Active immunisation by the injection of toxins in gradually increasing doses transformed the reaction in 90 per cent. of cases from positive to negative, and it appeared that the immunity thus produced was lasting. His experience also corroborated that of American observers who could look back three years and who claimed that the immunity lasted at least for this time. The disturbances which might occur during the production of immunity were very mild and were certainly not bad enough to stop the Dick method of inoculation spreading far and wide.

Prof. Csiky Jozsef, speaking on the pathology and treatment of headache, said that in his opinion the hereditary nature of neurasthenic headaches could not be contested. Amongst the causes of headache arising outside the skull the greatest importance should be attached to rheumatism, and it was remarkable that so little attention had been paid to this cause in Eastern Europe. The treatment was very simple—systematic massage and warm fomentations.

Dr. Joseph Tornai gave an address on heart disease and pregnancy, in which he said that two or three decades ago the mortality of childbirth associated with heart disease was 50–60 per cent.; nowadays it was only 12 per cent. at the most. Methods of examination, however, as he remarked, are more likely to reveal cardiac disease than they were formerly. Besides the strain which pregnancy threw on the heart there was the fear that endocarditis might recur. In general it could be said that in heart disease of slight degree, so long as the muscular action was strong, the prognosis was fairly good. Aortic disease was generally much more serious than mitral. The law did not allow the doctor enough freedom of judgment in cases where abortion might be required. It was very difficult to say when a patient ought to be advised against marriage, but he thought that a girl and her parents should undoubtedly be told the facts.

Prof. Arthur Hasenfeld, in a paper on angina pectoris, pointed out that even yet the ætiology of this disease was obscure. From the point of view of prognosis and treatment he deemed it proper to discriminate between angina pectoris on the one hand and aorta syphilitica and aorta nervosa on the other. As a prophylactic measure he thought it desirable that people who had contracted syphilis not more than 10 or 12 years before should receive specific treatment regardless of their condition or the results of a Wassermann reaction. Prof. Hasenfeld expressed himself as opposed to surgical treatment because it excited the patient and might provoke an attack, because it did not affect the fundamental coronary disease, and because pain was the natural warning sent by the heart when it was being given too much work to do.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Cost of Private Nursing.

SOME significant facts are emerging in the inquiry now being jointly conducted by the New York State Nurses' Association and the Committee on the Grading of Nursing Schools. The practice of assigning one nurse on constant duty to attend one patient is now seen to be an anachronism. It dates from some 50 years ago when women's services were limited in scope, plentiful within their limitations, and consequently inexpensive. To-day the reward paid for private nursing of $5 and $7 a day is not sufficient to draw large numbers to the profession and those who graduate as nurses are attracted in increasingly large numbers to salaried positions in institutions. The daily pay after all is not large. It was found that at a given time, and in the busy season (Feb. 21st–28th), only 72 per cent. of 1409 private duty nurses were at work; 23 per cent. were at home, and 5 per cent. were themselves sick in bed. The nurse, therefore, is not at work all the year round. And when she is at work her wage is found to average only 49 cents an hour, which is the equivalent of the earning capacity of "charwomen, servants, and unskilled labour." Nor is there prospect of advancement. There are no grades in private nursing and a graduate of ten years' standing is not supposed to charge any more than a nurse fresh from her training. Another count brought against private nursing is that the long hours of duty are unhealthy and demoralising, while the absence of professional occupation for a large part of the time adds to the demoralisation. It was found that 80 per cent. of the nurses at work were on 12-hour duty and 18 per cent. on 24-hour duty. Two solutions are indicated: the first is to increase the number of hospitals wherein each nurse can give attention to several patients; the second solution is one which is already finding expression in the growing activity of the Visiting Nurse Associations. Working for these associations the nurse visits several homes each day. It happens sometimes that a patient is so seriously ill that one nurse is assigned for constant duty, but this is a service which is very rarely demanded even though it is available. There may have been too much readiness to relegate to this system of care only those who cannot afford to pay for a full-time nurse. There is no moral or economic justification for any professional worker spending 12 or 24 hours on work that can be done with efficiency in a small part of that time.

The Spread of Tularæmia.

The Bureau of Biological Survey has recently issued a warning on the prevalence of tularæmia. Cases have been reported they say in 22 States, and in the district of Columbia which indicates in their opinion "that the disease probably occurs throughout the United States and that its recognition and occurrence in other States will be only a matter of time, as it was found in nine new States during the past year." The disease may be contracted by contact with the blood or internal organs of infected

animals—jack rabbits, snowshoe rabbits, cottontails, and certain species of ground squirrels. Many cases have occurred through dressing wild rabbits for the table or cutting them up for fish bait. Infection may also be transferred to human beings through the bite of blood-sucking flies and ticks. In human beings the usual symptoms are headaches, chills, bodily pains, vomiting, prostration, and fever, followed by painful swelling and later suppuration of glands. It is a disabling disease, incapacitating the patient for weeks or months and at times terminating fatally. Occasional cases of conjunctivitis tularensis are also being brought to light. One that occurred early this summer was reported by Dr. S. W. Jackson, of Atlanta, to the Georgia Medical Association. A boy of 18 went hunting and killed and cleaned several rabbits. Shortly afterwards his left eye became inflamed and assumed the appearance of acute purulent conjunctivitis. The usual treatment gave no relief. Smears and cultures were negative, but a blood examination gave positive agglutination for *Bacterium tularense*. This was said to be the fifteenth such case on record. From the economic point of view tularæmia may prove a blessing. It has virtually exterminated swarms of rabbits in some sections of Nevada, Arizona, Utah, and Wyoming, and it is now spreading to millions of destructive ground squirrels. The fact that ground squirrels are susceptible reminds one of the anxiety in California recently from the infection of these same animals with plague. Perhaps tularæmia may some day be used by health departments as a weapon against the latter more deadly disease.

PARIS.

(FROM OUR OWN CORRESPONDENTS.)

The Coué Institute.

NOT long ago the Minister of Labour and Public Health asked the Académie de Médecine to advise him whether the Coué Institute should be recognised as an establishment of public utility. A commission of eminent neurologists was appointed to consider the question and reported to the Académie that although the study of metapsychics is of great interest the knowledge available in this domain is still too fragmentary and too controversial to be applied in scientific therapeutics. All psychic and metapsychic institutes for treatment which are not wholly under the control of scientific men can have no scientific interest and may well be actually dangerous. Accordingly the Académie has decided that it would be inopportune to recommend recognition of the Coué Institute as an establishment of public utility.

The Sale of Skim Milk.

On behalf of the Public Health Committee of the Académie de Médecine Dr. Jules Renault has lately published a report in which he concludes that skim milk and half-cream milk, whether in the form of condensed milk or powder, ought not to be put on sale unless clearly labelled "Not to be given to young children or to invalids except by the orders of a doctor."

Oriental Sore Contracted in France.

As a result of the wars and massacres which have devastated the Near East, large numbers of refugees, most of them Armenians, have landed in France. Generally their intention is to go on to the United States, but permits to enter America are refused to invalids. A certain number of these refugees have been sufferers from oriental sore and Dr. Jeanselme, professor of dermatology at Paris, reports the case of a Russian sailor who contracted the infection from one of them at Marseilles. This is the second time that indigenous oriental sore has been noted in France. The first case was that of a child who lived during the war in proximity to a company of Kabyles and other North African natives.

Vaccinotherapy for Varicose Ulcers.

Dr. Léon Tixier and Dr. P.-R. Bize, of Paris, recently communicated a paper to the Société Médicale des Hôpitaux de Paris on the use of intramuscular injections of propidon for chronic ulcers of the legs. It is given in increasing doses and the results are described as remarkable. There is no doubt, they say, that vaccines have an action in restoring nutrition, acting at first on the ulcer by promoting granulation and reducing suppuration, and later on the peripheral tissues. Congestion is reduced and finally disappears and pain is eventually abolished.

Foreigners in Marseilles.

For a long time past the large number of foreigners in Paris hospitals has been arousing comment. The situation appears to be even worse in Marseilles, where in 1925, of 25,248 patients treated some 28 per cent. were foreigners. Most of them are Italians, for in certain parts of Italy it is traditional to seek one's fortune in Marseilles. It would be a good idea if Italy set up an Italian hospital in Marseilles, or at least gave a grant to the Marseilles hospitals, which find it difficult to carry on under the present strain. Most of the other foreigners come from the Near East, and Mr. Léon Imbert, who has issued a statement on the situation, holds that it would be suitable for the French Government, which has allowed or even encouraged their entry into France, to make some contribution to the expenses which weigh so heavily on the city's budget.

League of Red Cross Societies.

Colonel Ernest P. Bicknell, chairman of the Central Committee of the American Red Cross, has been elected vice-chairman of the board of governors and will act temporarily as director-general of the League, in place of Sir Claude Hill, who has been appointed Governor of the Isle of Man. Sir Claude Hill has been elected honorary director-general in recognition of the wise and valuable guidance which he has given to the League. The new administrative commission of the League, appointed by the executive committee, consists of E. J. Conill, Cuban Red Cross; H. E. Geoffray, of the French Red Cross; and Colonel Draudt, of the German Red Cross. The board of governors is expected to meet at Paris on May 4th, 1927.

French Flour.

By decree of the Minister of Agriculture, French flour must now include by-products resulting from the grinding of the grain; these have hitherto been considered waste or have been used for feeding farm animals, or in other ways.

Degrais has presented to the Société de Médecine de Paris an analytical study showing the superiority of radium to cryotherapy and other methods in the treatment of angioma. Radium, he says, is perfectly safe when employed by competent therapeutists; it is applicable to angiomas of any size and occupying any site; it is painless, it gives perfect cosmetic results, it is applicable at any age, and it never fails.

Acetylarsan has been tested for the treatment of yaws by Boisseau in the Congo region. It proved efficacious, he says, in 80 cases, representing all ages. Two injections of 0·23 g. each, corresponding to 0·05 g. arsenic, usually sufficed. The injections were given 48 hours apart.

There are still a few vacancies for the tour of the French spas of the Vosges region, which will be held from August 29th to Sept. 8th. The fee is 1050 francs, and particulars may be had from Dr. Gerst, 94, Boulevard Flandrin, Paris.

A post-graduate course on affections of the alimentary canal will be held from Sept. 13th to 24th at the Medical Clinic of the Hôtel Dieu, under the direction of Prof. Maurice Villaret. A three days' study tour to Vichy will follow. Further particulars may be had from the Secretary of the Faculté de Médecine in the University of Paris.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

SUMMER ADJOURNMENT.

PARLIAMENT adjourned on Wednesday, August 4th, for the Summer Recess. The date of reassembling was fixed as Tuesday, Nov. 9th, but if the stoppage in the coal industry is still proceeding a special sitting of Parliament will be called by Proclamation on August 30th, and monthly thereafter, in order to renew the Regulations under the Emergency Powers Act. Among the measures which received the Royal Assent before the adjournment was the Midwives and Maternity Homes Act, 1926.

ECONOMY IN HOSPITAL AND MEDICAL SERVICES.

The Select Committee on Estimates have issued a second report to the House of Commons on the possibilities of greater coördination of common services between departments with special reference to the three fighting Services. In a section of the report dealing with hospitals and medical services the Committee state:—

"One of the recommendations of the Mond-Weir Committee was that a Joint Medical Committee representative of the three fighting Services and the Ministry of Pensions should be set up to secure greater coördination. This Committee was appointed in July, 1923, but it has only met eight times in three years. The Committee attempted to obtain some standardisation of medical returns for the three fighting Services, but their labours only resulted in the combination of two of the forms used by the Army and Air Force. Your Committee were also informed that this Committee had never been able to consider the relative cost of the hospitals maintained by their respective departments because the methods of costing were different. They strongly recommend that similar methods of costing should be adopted, and that, as far as possible, all forms serving a similar purpose should be standardised.

"Although the Mond-Weir Committee recommended that greater use should be made of Army mechanical transport by the Navy and Air Force, your Committee regret to find that no steps appear to have been taken in this direction, apart from some experiments in the standardisation of ambulances, which are still going on.

"One of the functions of the Joint Medical Committee is to consider the amalgamation of hospitals where possible. The amalgamation of the hospitals at Gibraltar and Chatham was carried out in 1922, before the Joint Committee was set up. Since that date a scheme for the amalgamation of the three hospitals at Hong-Kong and Kowloon has been prepared, but has been delayed owing to recent events in that part of the world. Schemes for the amalgamation of the naval and military hospitals at Devonport and Plymouth and the two Air Force hospitals at Baghdad are under consideration, and your Committee hope they will be pressed forward. Your Committee also recommend that further consideration should be given to the possibility of combining the Army hospitals at Dover and Shorncliffe, of accommodating the wives and children of Army ranks stationed at Chatham in a wing of the Naval Hospital there, and abolishing the small Army hospital still maintained for this purpose. Your Committee also consider that the military hospital at Cosham might be absorbed either by Netley or the Naval Hospital at Haslar. Under existing circumstances the number of equipped beds maintained at both Netley and Haslar is too large, even allowing for the trooping season, and should be reduced.

"The naval and military hospitals at Malta are only some five miles apart, and there is ample vacant accommodation in the naval hospital for Army purposes. With modern motor transport such a distance is not insurmountable, and the only other argument against amalgamation advanced by the War Office—namely, that the Admiralty found their hospital too small for their own requirements—is not correct. Your Committee consider this question should receive early consideration.

"Your Committee investigated the scale of hospital accommodation provided for the Royal Air Force. They noticed that there did not appear to be any general fixed scale, even as a basis of calculation, of hospital accommodation to establishment. Where accommodation was required it was provided on the basis of the requirements of the year immediately preceding that in which the demand was met. This does not appear to the Committee to be a scientific or economical method of laying down a scale of hospital accommodation.

"The Ministry of Pensions is unable to utilise military hospitals to any appreciable extent, as they are not situated in large centres of population, where most of the ex-Service men reside.

"Your Committee consider, however, that a section of the surgical hospital at Roehampton should be set aside for nurses and the small nurses' hospital at Fernbank closed down."

On the subject of contracts the Committee state that the Air Ministry and Ministry of Pensions have a joint contract with the War Office for the supply of medical stores. The Committee see no reason why the Admiralty should stand out of this contract. Under the heading of Works Services the Committee state:—

"In your Committee's detailed examination of the works under execution by the Royal Air Force, it was brought to notice that at Halton a dental hut was being erected at a cost of £3760 in the middle of the camp. They were informed that this was solely to suit the convenience of the establishment, although accommodation could have been made available in the hospital which is also being erected in the same camp.

Your Committee were also informed that, although the new hospital at Halton will have nearly a hundred fewer beds than the existing one, accommodation for the same staff is being provided. The Air Ministry stated that this was due to the fact that the existing hospital is under-staffed. After comparing the existing staff with that of other hospitals, your Committee do not agree with this statement, and consider the estimate for the new staff to be excessive."

Among the Committee's principal recommendations are the following:—

That in the case of the hospital services of the three fighting Services and the Ministry of Pensions, similar methods of costing should be adopted and medical forms standardised to facilitate comparisons.

That the question of the amalgamation of the naval and military hospitals at Malta, at Devonport, and Plymouth, the two Air Force hospitals at Baghdad, and the military hospital at Cosham with either Netley or Haslar should receive early consideration.

That the War Office civilian hospital at Chatham and the Ministry of Pensions hospital at Fernbank should be closed.

That the estimate of the Air Ministry for the staff of the new hospital at Halton should be reduced.

THE FACTORIES BILL.

The text of the Factories (No. 2) Bill, which was given a first reading in the House of Commons on Monday, August 2nd, has now been published (Stationery Office. 2*s*.). It contains 140 clauses and is a measure which has been under the consideration of the Home Office for a considerable time. While it is similar in some respects to the Bill brought in, with the approval of Mr. ARTHUR HENDERSON, by the Labour Party, which was discussed in the House of Commons on March 6th, it differs from that measure in important particulars, and should be studied therefore as a new Bill.

An official memorandum explaining the extent to which the Bill differs from the existing law was published simultaneously by the Stationery Office (3*d*.). This memorandum states that—

The Bill has been introduced in order that the different industries affected may have the opportunity during the autumn and winter of examining the proposals for the amendment of the Factory Acts, which are being put forward by the Government for consideration, of consulting among themselves with a view to arriving at agreements on disputed points, and of submitting any representations they desire to the Government. The Bill is the result of a very careful review of the results of the long experience which has been acquired by the department concerned in the administration of the existing Act of 1901, of the inquiries of the numerous committees which have considered different parts and aspects of the wide field of industrial regulation, and of experiments and investigations conducted by the industries themselves and by individual manufacturers.

The Government do not expect that in a Bill of this kind, affecting many industries of widely varying character and dealing with a wide range of problems arising over the whole field of industrial health, safety, and welfare, there will not be many points in regard to which differences of opinion, possibly wide differences, may prevail in different quarters; but they believe that, on the whole, the Bill raises the general standard of factory conditions to the level of the better managed and more efficient factories, without placing any undue financial burden on industry, and that the result will be to promote the efficiency of industry as well as the welfare of the workers.

The Bill abolishes the distinction which exists in the present law between factories and workshops and between textile and non-textile factories and employs only the one term "factories"; and, except where otherwise expressly provided, the provisions of the Bill apply indifferently to factories of all descriptions. Under the existing Acts, the provisions relating to the sanitary condition of workshops, cleanliness, overcrowding, ventilation, and the drainage of floors, are enforced in the first instance by the local sanitary authorities and not by the factory inspectors (as in factories), and the provisions as to sanitary conveniences, both in factories and in workshops, are, in London and in any place where Section 22 of the Public Health Acts (Amendment) Act, 1890, is in force, also enforced by the sanitary authorities.

Under the Bill, all the corresponding provisions are enforceable by the factory inspectors, except that in any factory in which mechanical power is not used and which forms part of a dwelling-house or shop, or is adjacent to a dwelling-house or shop in the same occupation, the provisions are to be enforced by the sanitary authority; and in the case of any other factory in which mechanical power is not used, the Secretary of State if satisfied that the provisions would be satisfactorily enforced by the sanitary authority is to delegate the duty to them.

These alterations are of general application. The other alterations are alterations of particular provisions, and are indicated in a table subjoined to the memorandum in which, however, only alterations of substance are noted

Part I. contains general provisions in regard to health. Clauses 2 to 8 relate to cleanliness of factories and workshops, overcrowding, temperature, ventilation and lighting, the drainage of floors, and the provision of sanitary conveniences. Freedom from effluvia arising from any drain, sanitary convenience, or nuisance is insisted upon, and all accumulations of dirt and refuse must be removed from the floors and benches of workrooms as well as from the staircases and passages, and among other things it is provided that all inside walls, partitions, and ceilings shall be washed or recoloured every 14 months. A factory is to be deemed to be overcrowded if the number of persons employed in

any workroom is such that the amount of cubic space allowed for each employee in the case of factories constructed before the passing of the Act is less than 250 cubic feet, or, in the case of any other room, less than 400 cubic feet. Measures are to be taken to prevent the escape of injurious or noxious fumes into the air of any workroom, and in every workroom in which a substantial proportion of the work is done sitting the temperature must not, after the first hour during which the work is going on, fall below 60°. In regard to all these clauses the Home Secretary may make special orders dealing with the standard of cleanliness, temperature, the provision of fresh air, and so on.

Clauses 9, 10, and 11 deal with the power of district councils to enforce certain provisions of Part I., the powers of an inspector as to sanitary defects remediable by the district council, and the powers of the Secretary of State in cases where he is satisfied that there has been default on the part of the district council. Under Clause 10 an inspector is empowered to take with him into a factory a medical officer of health, sanitary inspector, or other officer of the district council. Clause 12 enables the Home Secretary, after consultation with the Minister of Health, to make provision for the special medical supervision of the workers in any factory, or class or description of factories, where such action appears to be necessary.

Part II. of the Bill (Clauses 13 to 36) deals with general provisions as to safety. Under Part III. (Clauses 37 to 41) general welfare provisions are included in regard to the supply of drinking water in factories, first-aid facilities, the provision of seats sufficient to enable all female workers to rest during intervals in their work, the supply of protective clothing against acids and noxious or offensive substances, and the powers of the Home Secretary in regard to welfare orders.

Special arrangements for health safety and welfare are also made in Part IV. (Clauses 42 to 58). Among the most important of these are the removal of dust or fumes, the prohibition of spitting, the meal rooms of workers in dangerous trades, the prohibition of the use of "white phosphorus" in the manufacture of matches, the prohibition of the employment of female young persons in certain processes, of women and young persons in lifting excessive weights, of women and young persons in certain processes connected with lead manufacture, and of women and young persons in processes involving the use of lead compounds. Underground workshops will be prohibited in certain prescribed industries where the inspector for the district certifies the room to be unsuitable for the purpose as regards construction, light, ventilation, or in any other respect. Basement bakehouses, except such as were in existence before the passing of the Act, will not be permitted. In Clause 55 the Home Secretary is given power to make regulations which appear to him to be reasonably practicable for securing the safety or health of persons employed in industries requiring special measures.

The notification and investigation of accidents and industrial diseases are dealt with in Part V. (Clauses 59 to 64). Clause 61 provides:—

(1) Every medical practitioner attending on or called in to visit a patient whom he believes to be suffering from lead, phosphorus, arsenical or mercurial poisoning, or anthrax, contracted in any factory, shall (unless such a notice has been previously sent) send to the Chief Inspector of Factories at the Home Office, London, a notice stating the name and full postal address of the patient and the disease from which, in the opinion of the medical practitioner, the patient is suffering, and the name and address of the factory in which he is employed or in which the disease was contracted, and shall be entitled in respect of every notice sent in pursuance of this section to a fee of two shillings and sixpence, to be paid as part of the expenses incurred by the Secretary of State in the execution of this Act. (2) If any medical practitioner, when required by this section to send a notice, fails forthwith to send the same, he shall be guilty of an offence, and liable to a fine not exceeding 40 shillings. (3) Written notice of every case of lead, phosphorus, or arsenical or mercurial poisoning, or anthrax, occurring in a factory shall forthwith be sent by the occupier in the prescribed form and accompanied by the prescribed particulars to the inspector for the district; and the provisions of this Act with respect to the notification of accidents shall apply to any such case in like manner as to any accident as is mentioned in those provisions. (4) The Secretary of State may by special order apply the provisions of this section to any other disease contracted in a factory.

Clause 62 provides that where a coroner holds an inquest on the body of any person whose death may have been caused by any accident or disease of which notice is required to be given under the Act the coroner shall adjourn the inquest unless an inspector or some person on behalf of the Secretary of State is present to watch the proceedings. Among other provisions in the clause there is a subsection which states that where evidence is given at an inquest at which an inspector is not present of any neglect as having caused or contributed to the accident or disease, or of any defect in or about the factory appearing to the coroner or jury to require a remedy, the coroner shall send to the inspector for the district notice in writing of such neglect or defect. Clause 63 gives the Home Secretary power to direct a formal investigation of any accident or disease occurring or contracted in a factory and its causes and circumstances.

Clause 64 provides:—

(1) It shall be the duty of the appointed doctor to investigate and report (*a*) upon cases of death or injury caused by exposure to fumes or other noxious substances, or due to any other special cause specified in instructions of the Secretary of State as requiring investigation; and (*b*) upon any case of death or injury which the inspector for the district in pursuance of any general or special instructions of the Secretary of State may refer to him for that purpose; and (*c*) upon any case of disease of which notice is sent under this Act. (2) The appointed doctor, for the purpose of an investigation under this section, shall have the same powers as an inspector, and shall also have power to enter any room in a building to which the person killed, injured, or affected has been removed.

Part VI. prohibits the employment of children in factories and prescribes the conditions under which women and young persons may be employed. Women and young persons may not be employed for more than ten hours in any day, or 48 hours in any week, and their employment shall not begin before 6 A.M. or end later than 8 P.M. on week-days and 2 P.M. on Saturdays. Not more than 4½ hours may be worked without an interval of half an hour for a meal. Notwithstanding these provisions such persons may work 100 hours overtime in the year, provided such overtime does not exceed six hours in any week. It is further provided that young persons under the age of 16 shall not remain in factory employment after a specified period unless they have been examined by an appointed doctor and certified to be fit for the employment. In the section which deals with home work a clause is inserted providing that:—

"Where work in respect of which this section applies is carried on for the purpose of or in connexion with the business of a factory in any place which is, in the opinion of the district council, injurious or dangerous to the health of the persons employed therein, the district council may give notice in writing to the occupier of the factory or to any contractor employed by him that the place is so injurious or dangerous, and if the occupier or contractor after the expiration of one week from the receipt of such notice gives out work to be done in that place he shall, unless it is proved to the satisfaction of the Court dealing with the case that the place is not in fact so injurious or dangerous, be guilty of an offence and liable to a fine not exceeding £20."

Clauses 112 and 113 deal with the appointment, duties, and fees of appointed doctors under the Act. Clause 112 provides:—

(1) The Secretary of State, and, if the Secretary of State so directs, the chief inspector, may appoint a sufficient number of duly qualified medical practitioners to be appointed doctors for any of the purposes of this Act, and may revoke any such appointment: Provided that where under this Act the duty of arranging for the medical examination or certification of young persons has been transferred to the local authority for any district, the appointed doctor for those purposes in that district shall be appointed by the local authority. (2) A medical practitioner who is the occupier of a factory, or is directly or indirectly interested therein, or in any process or business carried on therein, or in a patent connected therewith, shall not be the appointed doctor for that factory. (3) The appointed doctor for any factory shall have power at all reasonable times to inspect the general register of that factory. (4) The Secretary of State may make rules prescribing the duties of appointed doctors. (5) If and so long as there is no appointed doctor for a factory, the Poor-law medical officer for the district in which the factory is situate shall act as the appointed doctor for that factory. (6) References in the Workmen's Compensation Act, 1925, to a certifying surgeon shall be construed as references to an appointed doctor appointed by the Secretary of State or chief inspector under this section.

Clause 113 provides that the fees paid to doctors shall be such as may be determined by the Home Secretary, and such fees shall in the case of any examination or certificate with respect to the fitness of a young person for employment in a factory and in the case of any examination in pursuance of regulations of a person employed in a factory be paid by the occupier of that factory, and in any other case shall be defrayed as an expense of carrying the Act into effect.

By Subsection 3 of Clause 114 it is provided that the medical officer of health of every district council shall—

(*a*) in his annual report to the council report specifically on the administration of and furnish the prescribed particulars with respect to the matters under Part I. (Health) and Part VIII. (Homework) of the Act which are administered by the district council, and shall send a copy of his annual report or so much of it as deals with those matters to the Secretary of State; and (*b*) give written notice to the inspector for the district of any factory coming to his knowledge in which no abstract of the Act is affixed in accordance with the Act.

Part XII., which deals with penalties and legal proceedings, provides that the owner or manager of a factory guilty of an offence in contravention of the Act shall be liable to a fine not exceeding £20, and in the case of a continuing offence to a fine not exceeding £5 for each day of

its continuance. In cases of death or injury it is provided :—

"If any person is killed, or dies, or suffers any bodily injury or injury to health in consequence of the occupier or owner of a factory having neglected to observe any provision of the Act or any order or regulation made in pursuance of the Act, the occupier or owner of the factory shall be guilty of an offence, and, without prejudice to any other penalty, liable to a fine not exceeding £100, and, in the case of a second or subsequent conviction in relation to a factory within two years from the last conviction for the same offence, not less than £10 for each offence, and the whole or any part of the fine may be applied for the benefit of the injured person or his family, or otherwise as the Secretary of State determines."

HOUSE OF COMMONS.

MONDAY, AUGUST 2ND.

Accident at Orpington Hospital.

On the motion for the third reading of the Consolidated Fund (Appropriation) Bill,

Mr. HAYES raised a question in regard to an ex-Service man named William Richardson, who while a patient at the Ministry of Pensions Hospital, Orpington, in 1921, was knocked down and run over by a motor-car within the grounds of the institution. In a question which he had asked the Minister of Pensions on June 17th he suggested that the treatment which the man received in the hospital was not qualified or proper treatment. The reply of the Minister, which he regarded as unsatisfactory, was that the Ministry could not accept liability in the matter because the accident occurred at the hospital gates, and was caused by a private motor-lorry which had no connexion whatever with the Ministry. The Minister had added that he could find no grounds which in any way supported the suggestion of neglect or improper treatment on the part of the hospital staff. During the time that had passed since the question was last raised he had been able to obtain information which not only confirmed the statements he had made, but added to them, and he hoped that the Parliamentary Secretary, who he understood would reply on behalf of the Minister, would see the necessity of an inquiry into the matter. In July, 1921, Richardson was sent to Orpington Hospital for treatment for neuralgia and nerves. On Nov. 27th he was inside the grounds talking to a military policeman. A motor-car proceeding outside the hospital grounds came into collision with the corner of the wall of the hospital grounds and dashed into the grounds of the hospital. When it was six or eight yards inside the grounds it struck Richardson. He was seriously injured and taken into the hospital. He was not seen by the hospital surgeons; in fact, he was in his own ward for two or three hours before he was seen by a doctor at all. He was then seen by a physician and not by a surgeon. The physician said that his leg was badly bruised. No further steps were taken, and the man lay for 24 hours in the greatest pain with no further attention. Another 24 hours passed before the leg was X rayed, and it was only on Tuesday afternoon at 4 o'clock—the accident had occurred on the Sunday afternoon—that he was visited for the first time by a hospital surgeon. The limb was then examined and the surgeon said that it must be put into splints as soon as possible. Two hours later, or 51 hours after the accident, the sister in charge of the ward with two orderlies commenced to set the limb without any anæsthetic, local or general, and without any qualified assistance. It might be that up to that point there was no direct negligence or improper treatment, if it were the practice in any hospital for fractured limbs to be set by persons other than qualified surgeons. But he submitted that even if that was the practice, or if a limb could be set by a nurse assisted by orderlies, it was a highly improper proceeding that a man who was known by X ray examination to be suffering from a fracture should be treated in that way. The man's description of what he went through was something of this kind: "The sister got two orderlies and three or four patients to hold me down and then started pulling and twisting my limb unmercifully before applying the splints." That statement could be supported by substantial testimony. For 17 weeks the man lay in his bed, and when the splint was removed the limb was bent and twisted out of all recognition. Five days after the splint was removed the man received orders to leave the hospital immediately. After protest the man left, and on his return home saw his panel doctor, who after examining him said that he could do nothing in view of his terrible state. The man then went to the Sussex County Hospital for treatment. There he was examined by a surgeon, a Dr. Turton, who was also a doctor or surgeon of the Ministry of Pensions. Dr. Turton was aghast, as was also the surgeon-specialist who collaborated with him. They found that little or nothing could be done except by amputation, and the limb was subsequently amputated. He submitted that the man was inside the hospital grounds when the accident occurred, but even if he were not he would not have been at Orpington at all but for his condition, which was directly due to his war service. The responsibility for his presence in that hospital ought to be accepted by the Government.

Lieut-Colonel STANLEY (Parliamentary Secretary to the Ministry of Pensions) said that he realised that Mr. Hayes was raising this matter because of his interest in the man's case, and not from the party point of view, but there were one or two statements in his narrative with which he could not agree. At the time of the accident the man was standing at the gateway of the hospital, and in a thick fog a motor-lorry mounted the pavement and ran into him and knocked him down. Clearly the Ministry were not responsible, and attempts were made to trace the responsible party. The lorry itself was actually traced to a firm in the town, but they were able to prove that it was taken out without their consent or knowledge, and they could not be held liable. Mr. Hayes had made accusations which he (Colonel Stanley) thought he could hardly believe himself. In effect he said that the treatment of this man in the hospital was extremely brutal, and that he was not attended to for two or three hours after the accident. He had gone through the whole case carefully, and as he read the evidence the man was seen by a doctor at once, and was X rayed on the following day. It was not until then that it was ascertained that he had broken his leg. There were plenty of cases where a fracture was not revealed except as a result of an X ray photograph, and that was the case on this occasion. As soon as the discovery was made that the leg was broken the limb was set. There was no evidence that it was not perfectly properly treated and every possible care taken of the patient. All the time that the man was in the hospital the man made no complaint whatever of his treatment to the head of the hospital. When he was discharged five months later the X ray photograph showed that his leg had joined satisfactorily and was in a good condition. A court of inquiry which was held as soon as possible to investigate the whole case found that the accident was not the fault of the man, nor was it the fault of any official or servant of the Ministry. He could not see on what grounds, legal or moral, Mr. Hayes could claim that this man should be pensioned for his disability. If the hon. Member had fresh evidence it would be examined, but unless it was something completely new which could be corroborated he honestly did not see how he could claim that this man should be pensioned for anything else except his war disability.

The Bill was read a third time.

TUESDAY, AUGUST 3RD.

Rural Housing Bill.

Mr. NEVILLE CHAMBERLAIN (Minister of Health), in moving the second reading of the Housing (Rural Workers) Bill said there were two features which distinguished the rural housing problem from the urban problem. One was that in the country districts they had a population which was, generally speaking, stationary, if not declining; and the other was that even in pre-war times the agricultural labourer was never in a position to pay an economic rent for his house. Perhaps to that fact must be ascribed the practical stagnation of house building in rural districts for a great number of years. While the rural housing problem was certainly strictly limited in its extent, he did not want to convey the impression that there was no shortage of houses in the country districts. As a matter of fact there was a considerable amount of overcrowding in the villages. That overcrowding was partly due to the economic position which had caused a large number of houses to fall into disrepair and become according to modern ideas uninhabitable, though that did not always mean that they were uninhabited. It was also partly due to the fact that in many districts there had been an invasion of the country by the town dwellers. This had deprived the agricultural workers of the opportunity of getting improved houses.

This Bill did not attempt to deal with the question of new building. Even the increased subsidy given under the Act of 1924 had not been sufficient to produce any marked activity in the rural districts, but it had produced some. Up to the present about 200 local authorities had submitted for the approval of the Minister of Health schemes for providing some 7190 houses. The cost, however, was very high. The capital value of the Exchequer contribution towards these agricultural houses might be put at about £220 per house, and to that they had to add another £80 which was the capital value of the extra subsidy to be provided by the local authority. Our country villages contained a great deal that was characteristic of old England in style and material and in the architecture of the cottages. It would be something like an act of vandalism if they were to destroy these remainders of an older and more picturesque world in order to replace them with buildings which, though they might be sensible, were of a different style and could not be said to harmonise with their surroundings. There

was, therefore, a strong case for the underlying idea of the proposals in this Bill—namely, that they should devote themselves now to an attempt to recondition the old houses in the country and bring them up to modern standards of comfort and of sanitation where they were substantially built. It might be asked why the Government proposed to use public money to induce landlords to do what they ought to do themselves without public assistance. The answer was that a good many of these landlords were people of small resources who had not the capital necessary to make even such comparatively small alterations as the Government had in mind, and it was not likely without some extra stimulus that they would do in the future what they had not found it possible to do in the past.

Proceeding to describe the Bill in detail Mr. Chamberlain said that Clause 1 enabled local authorities to submit for the approval of the Ministry of Health schemes for the improvement of houses in the country. The second clause defined the power of the local authority to give assistance, and stated that the assistance may either be by way of grant or by way of loan, or by both. The assistance is to be given only to houses whose value after they have been altered does not exceed £400. No assistance may be given where the total cost is less than £50. The local authority can refuse to give any assistance at all if they are not satisfied that the house when it is completed is going to be satisfactory for habitation, and a special provision prevents the clause being applied to slums. There is a time limit on the operations of the Bill, and applications for assistance must be put in within a period of five years. Where the assistance is by way of grant, the grant may be made either by way of lump sum or by way of an annuity. It must not exceed two-thirds of the estimated cost of the works, and it is also limited to a maximum of £100 per house. It is also subject to various conditions which restrict the rent and limit the class of occupants. If any of the conditions are afterwards broken the grant becomes repayable together with compound interest, and is made a first charge on the house. Where the assistance is given by way of loan the loan may be made on mortgage up to 90 per cent. of the value of the altered house, and advances may be made while the works are in progress up to 50 per cent. of the work which has at any time been done.

In Clause 3 it was provided that for a period of 20 years the house must not be let to anyone whose income is not comparable with that of an agricultural worker, and furthermore during the same period the rent must not be more than the normal agricultural rent plus 3 per cent. upon the amount expended upon the alterations by the owner himself. The normal agricultural rent was defined for the purposes of the Bill as the average rent paid during the preceding five years, or if it had not been so let, the rent generally paid in the district by agricultural labourers. The owner may rid himself of the conditions which he has undertaken providing that he repays to the local authority the grant which he has received, together with compound interest up to date. Clause 4 defined the Government contributions to the expenses of the local authorities. The Government contributions must not exceed one-half of the assistance given by the local authority, and as the local authority's assistance was two-thirds of the total cost it would be seen that they contemplated dividing the cost equally, one-third being borne by the Government, one-third by the local authority, and the remainder by the owner himself. Clause 5 defined what was to be a local authority for the purpose of the Bill. He had come to the conclusion that on the whole the county council was the best authority to undertake the work in the majority of cases, but in cases where the district council ought to be the authority that matter could be adjusted at the discretion of the Minister. Clause 6 dealt with the application of the Bill to Scotland.

Mr. A. GREENWOOD, in moving the rejection of the Bill on behalf of the Labour Party, said that the sum which the Minister of Health took away from the insured persons earlier in the year was to go to provide an additional subsidy to the many already enjoyed by the landlords of the countryside. The Bill was full of deceptions, and its principle was one with which the Labour Party could not agree.

Lieut.-Colonel FREMANTLE said there were two things which were particularly piteous to those who had the practical dealing with housing difficulties on the spot. The first was that the obvious needs of housing were made a cockpit of politics and were opposed not for housing reasons, but for reasons of political theory pure and simple. That was the reason of the opposition to this Bill. The second thing was that one saw the old long-tried remedy repeated in different forms again and again brought into the House and put into legislation with the same kind of ideas and ideals, only to prove perfectly useless and worthless in actual practice. He wanted to follow out those two remarks from the point of view of an old and tried medical officer of health. On paper it was obvious that it would be better to sweep away old and bad housing and to rely on new housing. They had tried that method for the past seven years, and they had tried it for years before the war. The result had been a few thousand houses built in the country, but that had not touched the real problem, especially the need of the labourer. The people could not possibly wait until they could build the necessary number of new houses and close the old ones. It had been the one constant endeavour of medical officers of health, especially under the 1909 Act, to pull together the work of all the district officers throughout the county, to summarise their reports, to bring the results before the county council, and to work hard in coöperation with the district authorities in order to see that action was taken where they could not induce the county council itself to use its powers or to take more drastic steps. The result of all this procedure officially was very slight, but in actual practice he would not say that it had been so slight. This procedure had applied all kinds of pressure and had resulted in education of a most valuable kind. It had been found, however, that the district council was too close to the man to be coerced to be able to use powers of coercion properly. If they took the larger area—the area of the county—he hoped that they would be able to act more effectively. But mere coercion would not solve the problem; they must look the economic facts in the face. Would they get managers to run estates any more cheaply than the landlords did now? He believed that the present way of running them was the cheapest, but like many other cheap things it did not give altogether satisfactory results. He was disappointed that the Opposition had not put forward some constructive proposals calculated to lead to more effective results. He was perfectly certain that it would be impossible for the State to take over these bad houses, put them into repair, and manage them. They must at the present moment deal with the situation as they found it. On the question whether the county council or the district council should be the authority in this case he could conceive of only one way in which the county council could properly manage public health affairs, and that was by the firmest coöperation between the two bodies. The district council was in many cases quite unequal to the responsibilities which a much higher standard of public health wished to impose upon them, and it was there that the county council must come in. In this Bill the authority was given in the first instance to the county council, but they had power to devolve it in certain cases to the district council. He thought that that was probably the right line.

The Bill was read a second time by 213 votes to 71.

Lead Paint Poisoning.

On consideration of the Lead Paint (Protection against Poisoning) Bill, as amended in Standing Committee,

Mr. RHYS DAVIES moved a new clause to prohibit the use of lead paint in painting the interior of buildings. He said that it was an erroneous deduction that the Government and their supporters had arrived at that Regulations would prevent lead poisoning. There was, in fact, no way of dealing with the question except by the total prohibition of the use of white lead in paint. This new clause, if carried, would ratify what was termed the Geneva Convention.

Mr. MONTAGUE seconded.

Major HILLS supported the clause. The Geneva Convention was signed by the British delegates at Geneva, and he did not wish to see this country fall behind in leadership in industrial reform.

Captain HACKING (Under Secretary for the Home Department) said there was no breach of faith in this matter. Sir Montague Barlow, who signed the Geneva Convention, had declared that he voted as he did on the basis of the compromise being a satisfactory one acceptable to all. It was clear that the compromise was not acceptable to all. A Departmental Committee afterwards reported, and Sir Montague Barlow said that the report seemed to indicate that in view of recent discoveries some of the restrictions embodied in the Draft Convention were no longer of such vital importance as they had been. Prohibition for indoor painting and regulation for outdoor painting would be a difficult arrangement to carry out. Regulation as a whole would be much easier to put into operation with success. These regulations were only in the nature of an experiment. If they failed the Government would not hesitate to bring in another Bill far more drastic with prohibition as its essence. He appealed to the employers to coöperate in making the Regulations a success.

The new clause was rejected by 198 votes to 74.

Dr. WATTS moved an amendment to Clause 1 to provide that a medical examination of those engaged in the industry should take place monthly. He said that he had had 25 years' experience with regard to lead poisoning, and he attached the greatest importance to the method of preventing lead poisoning by medical examination. Hon. Members had spoken as though lead poisoning were an acute disease and might arise from one exposure to infection. He would remind them that it was a chronic disease, which often took

months, and even years, to develop. Fortunately, it had certain well-marked premonitory symptoms by which it could be easily recognised by medical examination, such as the progressive anæmia and the destruction of the red corpuscles of the blood, which could be easily recognised by the analyst and by the medical examiner, and there was the power under these Regulations to suspend from employment a workman whose health was or appeared likely to be injuriously affected, such as had been found previously, in the case of carbon bisulphide poisoning and mercurial poisoning to be quite sufficient. In order, however, that the examination might be absolutely efficient it was necessary that it should be carried out at certain stated intervals, and that was why he suggested the insertion of the word "monthly."

Captain HACKING said he could not accept the amendment, but if his hon. friend would agree to the word "periodical" he would accept that.

Dr. WATTS withdrew his amendment and the word "periodical" was agreed to.

Dr. WATTS moved an amendment to provide that the medical examination should be made by a certifying factory surgeon. He said that under the Bill the examination could be made by any medical man, but he wished to restrict the department to an examination made by a certifying factory surgeon—that was a surgeon who had had considerable experience in examining and treating cases of lead poisoning.

Captain HACKING said he could not accept the amendment. Whilst almost always the Home Office had the examinations made by certifying factory surgeons, it might be necessary in certain cases that a specially appointed doctor should be substituted. But the great qualifications of the certifying factory surgeon would not be overlooked.

The amendment was negatived.

Sir ROBERT NEWMAN moved an amendment to Clause 2 to omit the provision excluding women from working in the industry.

Dr. HADEN GUEST said he hoped the Government would not be led into adopting the reactionary course advocated by Sir R. Newman. There were real physical differences between men and women. The fact that lead poisoning was one of the causes of abortion, and a very important and serious cause, was a sufficient reason in itself to justify a very careful examination of this case, even if it was desired to go back on the proposals of the Bill, which he hoped would not be done. There was a very considerable death-rate from lead poisoning. Why should women and children be exposed to the risk of that death?

Captain HACKING said the chief reason why he could not accept the amendment was that lead poisoning was a greater danger to women than it was to men. Sir Thomas Oliver, one of the greatest authorities on lead poisoning, said: "On the whole females suffer more severely from plumbism than males." Sir Thomas Legge, the Chief Medical Inspector of Factories at the Home Office, said: "Women are more susceptible to poisoning by lead than men." If there was a discrimination in this matter it was a discrimination in the interests of the health of the women.

The amendment was negatived and the Bill was read the third time.

Venereal Disease.

The Venereal Disease Act (1917) Amendment Bill, a measure presented by Mr. BASIL PETO, to permit the sale by chemists of disinfectants for protection against venereal disease, was read a second time and committed to a Standing Committee.

Housing Subsidies.

Sir JOSEPH NALL asked the Minister of Health if he could make any further statement regarding future policy as to the housing subsidies.—Mr. NEVILLE CHAMBERLAIN replied: It is the general policy of the Government to bring to an end the subsidies under the Acts of 1923 and 1924 as soon as practicable, but it is recognised that this can only be done gradually and with sufficient notice to enable local authorities and those engaged in the building industry to accommodate themselves to the position, in order to avoid breaking the continuity of house production. The statutory review under the Act of 1924 falls to be made after Oct. 1st next, and I cannot at the present time say what reduction of subsidies, if any, may be made by order under that Act. Any such order, however, must be confirmed by resolution of this House before becoming operative. In the meantime I have decided that houses completed by Oct. 1st, 1927, will be eligible for the present rate of subsidy.

Air-craftsman and Tuberculosis.

Mr. A. R. KENNEDY asked the Secretary of State for Air whether his attention had been called to the case of Mr. F. S. Smith, ex-leading air-craftsman, No. 159,945, Royal Air Force, and to the fact that this young man had been discharged from the Air Force suffering from acute tuberculosis after several years' service, including service in the East, and had been refused disability pension, though he had no previous tubercular history, and his medical advisers were of opinion that the disease was directly attributable to his service, and whether he would appoint an appeal tribunal which would ensure a fair consideration of the testimony on both sides in this and similar cases, or would take other steps to remove the sense of injustice caused by an adverse decision arrived at in the absence of medical testimony offered by the applicant.—Sir SAMUEL HOARE replied: As the answer is rather long I will, with my hon. friend's permission, circulate it in the official report. As regards the first part of the question, I am advised that the Royal Air Force medical authorities were unable to discover any specific incident of this airman's service in the Royal Air Force which could be regarded as a factor either in the production or in the aggravation of the tuberculosis for which he was invalided. The incidence of this disease amongst Royal Air Force personnel at home and abroad is practically the same and compares favourably with the incidence amongst the civil population of England. There is no evidence to show that general service conditions in Iraq, Egypt, Palestine, or India, are provocative of the onset of tuberculosis. The fact that the disease manifested itself after the airman's entry into the Service does not prove that Service conditions played any part in producing it. As regards the second part of the question, I would refer my hon. friend to the answer given by the First Lord of the Admiralty on May 18th.

Appointments to Senate of London University.

Dr. LITTLE asked the Vice-Chamberlain of the Household, as representing the Lord President of the Council, upon what advice, if any, he made his selection of persons whom he might recommend for appointment by His Majesty in Council to serve upon the Senate of the University of London.—Major HENNESSY replied: My noble friend the Lord President regrets that he is unable to comply with the request of the hon. Member.

Fatalities in the Air Force.

Colonel ENGLAND asked the Secretary of State for Air if he would give the total number of fatalities to members of the Royal Air Force since Jan. 1st, 1926, indicating the countries in which these fatalities had occurred and the causes, so far as they were known, of the different accidents.—Sir SAMUEL HOARE replied: On the assumption that the hon. and gallant Member requires particulars of fatalities in accidents of all kinds, they are as follows, for the period Jan. 1st to July 27th, 1926:—

(*a*) Deaths due to flying accidents, 44; other accidents, 14; total, 58.

(*b*) The number of flying accidents was 25, and their causes and the countries in which they occurred were as follows:—

(A.) Home. (B.) India. (C.) Iraq. (D.) Egypt and Palestine. (E.) Mediterranean.

	A.	B.	C.	D.	E.
(1) Error of judgment	8	3	2	4	2
(2) Weather	1	—	—	1	—
(3) Aircraft defect	1	—	—	—	—
(4) Cause not yet known or indeterminable	—	1	1	1	—

(*c*) Particulars as to the 14 non-flying accidents are as follows:—

	A.	B.	C.	D.	E.
(1) Struck by air screen	—	—	—	—	1
(2) Bomb accident	—	1	—	—	—
(3) Motor-car and cycle accidents	12	—	—	—	—

Cost of Poor Relief, Unemployment Relief, and School Feeding.

Sir HARRY BRITTAIN asked the Chancellor of the Exchequer what money had been spent out of public funds on relief of the poor, relief of unemployment, and school feeding during the past financial year and during the present coal stoppage respectively; and what proportion of this expenditure was attributable to mining areas.—Mr. R. MCNEILL (Financial Secretary to the Treasury) replied: The total cost of domiciliary relief for the year 1925-6 was £15,326,700, while the corresponding figure for the eight weeks to June 26th last was £4,025,000. £2,400,700, or 15·7 per cent., of the former amount and £1,352,000, or 33·6 per cent., of the latter amount was incurred in 31 Poor-law unions specially affected by the coal dispute, though the dispute has affected other areas in less degree. It is estimated that during the 12 weeks ended July 24th the cost of feeding school-children in the mining areas was about £225,000, or about 25 per cent. in excess of the expenditure on this service for the whole country during the whole year ended March 31st, 1926. As regards other expenditure on relief of unemployment I find that an allocation between mining areas and the rest of the country could only be made to a limited extent, and would take some time to work out.

Nurses in Prisons.

Mr. PETHICK-LAWRENCE asked the Home Secretary what number of trained male nurses were employed in His Majesty's prisons; what training and what certificates of efficiency such male nurses held; what was their proportion to the daily average number of prisoners; whether any trained women nurses were employed in His Majesty's prisons for men; and, if so, how many women nurses were so employed and what was their proportion to the daily average number of male prisoners.—Captain HACKING (Under Secretary for the Home Department) replied: 131 male hospital officers, certified efficient by a board of medical officers after training at Parkhurst, are employed in prisons. Their proportion to the daily average number of prisoners for 1924–5 is about 1 to 75. Forty-seven of them are on the State Register of Nurses. In prisons for men, women nurses are only employed when the medical officer thinks that necessary in special cases.

Mr. PETHICK-LAWRENCE: Does that mean that there are no permanent working nurses and that they are only brought in in case of emergency?

Captain HACKING: Yes, that is what it means.

Mr. PETHICK-LAWRENCE asked the Home Secretary what number of women nurses were employed in H.M. prisons for women; what training and what certificates of efficiency such nurses held; and what proportion they bore to the daily average of women prisoners.—Captain HACKING replied: Twenty-three registered nurses and 18 hospital officers are employed in women's prisons. The registered nurses hold such certificates of training as are required by the General Nursing Council for registration. The hospital officers were trained in the larger prison women's hospitals and passed as efficient by the medical officers. The proportion of the 41 to the daily average female population for 1924–5 is about 1 to 23.

Lancashire Coroner's Error.

Colonel DAY asked the Attorney-General if his attention had been drawn to the failure of Mr. D. N. Haslewood, a Lancashire coroner, to view the body of George Frederick Margerison, upon whom an inquest was held in accordance with Section 4, subsection (1), of the Coroners Act, 1887; and whether the Lord Chancellor had taken any action in the matter.—Sir D. HOGG replied: The Lord Chancellor's attention has been drawn to the case alluded to. It appears that by an error the coroner omitted to view the body. Proceedings have been taken in the King's Bench Division and a proper inquest has been directed to be held. The Lord Chancellor does not propose to take any action in the matter.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. to be Surg. Comdrs.: R. A. W. Ford, C. H. M. Gimlette, W. H. A. Sinclair-Loutit, W. I. Gerrard, R. Buddle, and W. P. Vicary.

ROYAL ARMY MEDICAL CORPS.

Cols. H. P. W. Barrow and D. Harvey to be Maj.-Gens.
P. F. Palmer and G. A. Walmsley to be Temp. Lts.

ARMY RESERVE OF OFFICERS.

Lt.-Col. and Bt. Col. Sir A. L. A. Webb and Lt.-Col. and Bt. Col. P. S. Lelean, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

TERRITORIAL ARMY.

Lt.-Col. S. J. Fielding to be Bt. Col.

Maj. (Prov.) E. M. Douglas-Morris is confirmed in his rank.

Capts. G. E. Lindsay and J. A. Fretton, late R.A.M.C., to be Lts., and relinquish the rank of Capt.

J. Rannie, late Surg. Sub-Lt., R.N.V.R., to be Lt.

2nd Lts. C. D. Bruce, late R.G.A., and E. L. Martin, late Welch R., to be Lts.

M. R. Coolican to be Lt.

Hygiene Companies: A. O'Hanlon to be Lt.

ROYAL AIR FORCE.

J. O. Priestley is granted a short service commission as a Flying Officer for three years on the active list.

The undermentioned Flying Officers are promoted to the rank of Flight Lt. on promotion to the rank of Temp. Capt., General List, Army: A. Rhodes, H. R. Peek, and N. F. Smith.

Flight Lt. A. W. Comber relinquishes his temporary commission on ceasing to be employed.

INDIAN MEDICAL SERVICE.

Temp. Lts. Gurdat Singh Gill and Lal Singh Anand to be Temp. Capts.

The King has approved the retirement of Lt.-Col. E. C. G. Maddock.

DEATHS IN THE SERVICES.

Lieut.-Colonel Rochfort Noel Hunt, D.S.O., R.A.M.C., died suddenly on July 26th aged 53. He was educated at the University of Dublin, where he graduated M.B., B.Ch. in 1900. He received his first commission in the Service in November, 1900, became Captain in 1903, Major in 1912, and Lieut.-Colonel on March 2nd, 1923. During the war he commanded the hospital ship *Nevassa*, No. 135 Field Ambulance No. 7 and No. 42 Casualty Clearing Station, and No. 35 General Hospital, the latter for over four years, and saw service in Egypt and in France. Twice mentioned in despatches in 1917, he was awarded the D.S.O. in 1918, and in 1919 he was the recipient of the Médaille des Epidemics (Vermeil, France). On account of heart trouble he was placed on the half-pay list and retired on retired pay on Nov. 23rd, 1925.

Surgeon-Captain John Charles Groscort Reed, R.N., retired, died on August 2nd aged 53. He was appointed surgeon in the Royal Navy in 1896, and four years later was at the taking of the Taku Forts during the war in China in the *Algerine* (China medal and Taku clasp). He was on duty at the time in a temporary hospital between the attacking ships and the forts. Later he accompanied the first water party for the relief of Tientsin. He was serving at Bermuda when war broke out, and for the last two years of hostilities was afloat as senior medical officer of the battleship *Thunderer* in the Grand Fleet. He reached the rank of staff surgeon in 1912 and retired in 1923 after being surgeon-commander in the *Actaeon*, Torpedo School, Sheerness, and in Chatham Naval Barracks.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 31ST, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 66 (last week 91); scarlet fever, 1245; diphtheria, 728; enteric fever, 65; pneumonia, 376; puerperal fever, 38; cerebro-spinal fever, 6; acute poliomyelitis, 25; encephalitis lethargica, 44; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 123. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 4 (0) from enteric fever, 14 (1) from measles, 3 (0) from scarlet fever, 23 (3) from whooping-cough, 21 (4) from diphtheria, 70 (20) from diarrhœa and enteritis under 2 years of age, and 14 (2) from influenza. The figures for diarrhœa and enteritis for the last July week show a comparatively small rise on those of the previous week—namely, 68 (12). The figures in parentheses are those for London itself.

Typhus Fever in Glasgow.—A small outbreak of typhus fever has been reported to the Public Health Department in Glasgow, seven persons (six of them belonging to one family) having been removed to hospital during the first week in August. The cases all came from the Govan district and the immediate contacts are being kept under observation at the reception house, where one has since been taken ill with similar symptoms. No definite conclusion has yet been reached regarding the source of infection.

DANISH HOSPITALS.—Dr. Ralph Picken, medical officer of health for Cardiff, has reported to the Corporation upon a recent visit to eight general hospitals in Denmark. There are in that country 173 hospitals with four beds per 1000 of the population, and Dr. Picken found that the bulk of the accommodation is equal to that of the British voluntary hospitals, and that "the best is better than anything we have." The most marked divergence between the practice of the two countries is in ward accommodation. Instead of wards holding 18 or 20 patients, and sometimes more, in Denmark the unit is arranged somewhat on the lines of our own sanatorium or tuberculosis pavilions, a wide corridor at the rear giving access to a series of rooms of various sizes, all of them with windows to the south. Even the smaller hospitals are equipped with new X ray plants, and provision for light treatment, hydrotherapeutics, mechanical treatment, massage, and electrotherapeutics.

Correspondence.

"Audi alteram partem."

PASTEURISATION OF MILK.

To the Editor of THE LANCET.

SIR,—At a time when it is becoming the general rule for dairies to supply their consumers with "pasteurised" instead of raw milk, it is well to consider the advantages and disadvantages of heated as compared with fresh milk. There is a large proportion of people using "pasteurised" milk under the impression that they are receiving the raw product, and the medical officer of health for Poplar is right in holding that when "pasteurised" milk is sold to the public the purchaser should be informed of the fact. Forming as it does the basis of diet for infants and young children, milk should be supplied as clean as possible, and at a price which is not prohibitive to the poor, but it should also retain the greatest amount of its natural vitamins and ferments.

During "pasteurisation" the lactic-acid, but not the putrefactive or sporulating, bacteria are destroyed, with the result that the milk may go bad without curdling if kept for any length of time. Curdling is still looked on as the signal of milk going bad, and the public should be educated not to drink products which are totally unfit for consumption, simply because there is no clot. Dr. Eric Pritchard,[1] while supporting the general use of "pasteurised" or scalded milk, mentions the fact that at the Infants Hospital the milk supplied to premature or young babies who are not breast-fed is deliberately soured with lactic-acid bacteria, since it is thereby rendered more digestible than "pasteurised" milk. Vitamins are partially destroyed on heating, and Prof. Plimmer [2] reminds us that heating twice is totally destructive to vitamin C, as in the boiling of already "pasteurised" milk. This is especially important in the preparation of many proprietary infants' foods where starch or partially digested starch is present and where it is necessary to make the food with boiling milk and water.

Although it is frequently stated that heating to a temperature of 145° F. does not impair any of the characteristics of the milk, it can be shown by simple tests that the reductase is destroyed. Since enzymes are placed in milk by nature for definite physiological reasons, there is no justification for removing them unless some definite advantage is gained thereby.

In 1883 Richet, working on his patient Marcelin, discovered that whereas fresh cow's milk was digested in three and a half hours, boiled milk required four hours for digestion. In this connexion results which I obtained by peptic digestion in vitro are of interest.

	Hours incubated.		
	2.	18.	36.
Cold milk.	C.	M.L., small, broken heavy curd.	Nearly digested.
Milk warmed to 50° C. = 122° F.	Well c.	M.L., small compact curd.	Not so well digested.
Milk boiled and cooled.	C.l.	Flocculent heavy curd.	
Cold milk and water in proportion of 7 to 5.	C.	M.L., small, broken heavy curd.	Nearly digested.
Milk and water warmed to 50° C. = 122° F.	C.	M.L., small compact curd.	Not so well digested.
Milk and water boiled and cooled.	C.l.	Flocculent heavy curd.	

C. = Curdled. l. = Lightly. M.L. = Mostly liquid.

[1] Brit. Med. Jour., 1925, ii., 247.
[2] Practitioner, 1925, i., 31.

If pasteurisation is only used for the benefit of the consumer there is much to be said in its favour. But since sporulating bacteria are not destroyed the milk should be consumed within 18–24 hours of pasteurisation, whereas it has been admitted to me by a dairy manager that he keeps milk at his shop for 36 hours before sale, a thing which would be impossible without heating. Another manager has told me that "pasteurised" milk goes bad at times in his shop before sale, also pointing to the fact that it is not disposed of quickly enough.

At the present time there appears to exist great confusion as to the various grades of milk according to the Ministry of Health regulations, and I know of at least one manager of a multiple company who regularly sells "pasteurised," not Grade A milk, as Grade A and maintains that it is all one and the same product. In my opinion, all shops selling any of these graded milks should possess a copy of the regulations affecting their sale, both in their own and in their customers' interests. To sum up, it seems doubtful whether the best interests of the public are really being served at the present time by more or less general pasteurisation of milk without educating the consumer on the advantages and disadvantages accruing from the process.

I am, Sir, yours faithfully,

THOMAS MCLACHLAN, D.C.M., A.I.C.

August 4th, 1926.

STATUS LYMPHATICUS.

To the Editor of THE LANCET.

SIR,—An annotation in your issue of June 12th contains comments upon a case of status lymphaticus published by me in the May number of the *Canadian Medical Association Journal*. As some criticism is levelled against the diagnosis, perhaps you will allow me to supply additional information regarding the case.

Your annotation suggested that the case might have been one of myocardial degeneration and that death was due to this cause. Exigencies of space precluded a minute and detailed account of the histological investigation of all the organs. The myocardium was, however, carefully examined microscopically and no changes of an inflammatory or degenerative type were found. Special attention was paid to the sections stained with Scharlach R. and no evidence of fatty degeneration could be seen. Another possible omission is suggested by your article—namely, that we were dealing with an early case of acute meningitis and that cultures should have been made from the brain. As I had some experience of sudden death from fulminating cerebrospinal meningitis during the war, this was a matter towards which I specially directed my attention at the time of the post-mortem examination. It is true that no cultures were made from the brain, but there was not the faintest trace of inflammatory change in the meninges. I am interested to know that Prof. Glynn has found cases which give positive results bacteriologically when the disease (meningitis) is "practically not demonstrable" otherwise. But I take it that there must be something visible to the naked eye. As we were on the look out for the condition, and carefully inspected the middle ear, mastoid, ethmoidal and sphenoidal sinuses as well as the meninges, I think that possibility may also be eliminated. Apart from the generalised lymphoid hyperplasia, the scarring at the lung apices, and the enlarged thyroid, the striking features at the post-mortem examination were the intense venous congestion of the organs associated with a dilated right heart, petechial hæmorrhages, and the pulmonary emphysema. The congestion, dilated heart, and the hæmorrhages were all probably associated and were due to the mode of death. The emphysema of the lungs was sufficiently striking to suggest an anaphylactic element in the case.

I admit the unsatisfactory nature of the diagnosis and our ignorance as to the pathology of the condition.

We can only hope that the labours of the Committee of the Pathological Society will result in something more tangible and a better definition as to what exactly is to be understood under the term status lymphaticus.—I am, Sir, yours faithfully,

JAMES MILLER.

Queen's University, Kingston, Canada, July 29th, 1926.

SURGERY OF ELONGATED PELVIC COLON.

To the Editor of THE LANCET.

SIR,—Mr. E. G. Slesinger's paper on this subject in your last issue will create widespread interest. The elongated pelvic colon is a serious cause of stasis. In its extreme form the elongation is enormous and is an insuperable obstacle to successful treatment. Its surgical removal offers great attraction, and Mr. Slesinger's cases prove that success may follow resection of redundant bowel with end-to-end union. But success is not invariable. I have records of a good many X ray observations after resection (for cancer, diverticulitis, &c.). Union is perfect, but function remains imperfect and does not improve with time. There is a break in peristaltic continuity, due to division of Auerbach's plexus. The peristaltic waves do not bridge the gap. Fæces accumulate at the union until enough has been thrust through to start an independent wave in the distal section. Mr. Slesinger gets over this difficulty by giving paraffin and by enemata if paraffin fails. My own conviction is that a case severe enough to warrant surgery is best treated by complete colectomy, for then the distal section receives no solid matter and cannot become obstructed. I am well aware that colectomy is a serious responsibility. If Mr. Slesinger's less drastic operation can be made to succeed, it will be a boon indeed.—I am, Sir, yours faithfully.

ALFRED C. JORDAN.

Upper Wimpole-street, W., August 7th, 1926.

THE DEFINITION OF DRUNKENNESS.

To the Editor of THE LANCET.

SIR,—As a police surgeon it is my unpleasant duty to examine persons accused of drunkenness, and like Dr. N. I. Spriggs I have been unable to find a satisfactory definition of the condition.

The committee appointed by the British Medical Association to consider the tests for drunkenness will doubtless formulate a concise and comprehensive definition. Meanwhile I define drunkenness as an obvious impairment of the functions of the nervous system due to alcohol. Alcohol disturbs first the higher intellectual faculties, then the motor centres. If a suspected person sways or staggers in his gait, slurs his speech, or makes clumsy and ill-adjusted movements when he sits down, handles his cigarette case or other familiar things, I assume that there is a disturbance in equilibrium in the coördination of the muscles. This loss of control of the motor mechanism, when due to alcohol, indicates a more pronounced impairment of the higher functions of the brain and is definite evidence of drunkenness. And as arrests for drunkenness are rarely made unless the suspected person smells of alcohol, and has the muscular incoördination and disorderly behaviour peculiar to alcohol, very few sober people are taken into custody.

When there are no motor symptoms, and one has to rely on mental changes only, drunkenness is not always easy to detect, for the medical man does not know the normal condition of the drinker, and has no standard of comparison. The mental derangement which attends the slighter forms of intoxication is usually revealed by the self-satisfied behaviour of the affected person. The drunken man is pleased with himself and his conduct; he has a diminished sense of his responsibility, and if a motorist makes light of any accident that may have occasioned his arrest. Although accused of drunkenness he loses his caution, and states the kind and number of drinks he has had. He breaks the convention in a way he would not do when sober; he wears his hat indoors, sits when he should stand, smokes without permission, and is familiar and facetious. He is talkative and argumentative, and may wander off to irrelevant subjects. He loses control of his emotions and becomes maudlin or too genial.

When these mental symptoms are combined with muscular incoördination there is no doubt about the diagnosis. When, however, the mental symptoms are present without motor derangement the suspected person is often said to be under the influence of drink but not drunk. This phrase is misleading and is better avoided. It led to the acquittal of Dr. Spriggs's "drunken" motorist and has been equally serviceable to many another drunken man. It is probable that half the adult population is under the influence of alcohol at some time in the day, but not every person so influenced is drunk. If, however, the mental effects of alcohol can be readily detected, not only is the subject under the influence of drink, but according to my definition he is drunk. He may be steady on his legs and correct in his speech, but his sense of responsibility, his judgment, his estimation of distances, and his caution are all gravely impaired and replaced by a reckless sense of well-being and disregard of danger which make him a greater menace to society than any person who is drunk and incapable.

I am, Sir, yours faithfully,

Birmingham, August 9th, 1926. G. A. WILKES.

DEFENCE OF ASSISTANTS AND LOCUM TENENTS.

To the Editor of THE LANCET.

SIR,—I am instructed by the Council of the Medical and Dental Defence Union of Scotland Limited to bring before the notice of your readers the fact that this Union, which enrols medical and dental practitioners in any part of Great Britain and Northern Ireland, has always accepted responsibility for the acts of their member's assistant or locum tenent. If, therefore, a claim is made, or an action raised against a member of this Union in respect of a negligent (or alleged negligent) act of his assistant or locum tenent, the Union will defend the case. The Union's indemnity insurance scheme, under which members are protected in the event of an action against them being unsuccessfully defended, also covers the member, not only against his own negligence, but that of his assistant or locum tenent.

I am, Sir, yours faithfully,

W. FINDLAY,
Secretary and Treasurer to the Union.

155, St. Vincent-street, Glasgow, C. 2, August 3rd, 1926.

CERTIFICATION OF INJURY UNDER THE WORKMEN'S COMPENSATION ACT.

To the Editor of THE LANCET.

SIR,—I see from your report of the Representative Meeting (THE LANCET, July 31st, p. 229) that the British Medical Association is considering a form of certificate to be issued to injured employees at the request of the employer, who acts on the instructions of the insurance company. This question has interested me for some years, and I made inquiries about it from two solicitors, one barrister, and one representative of an insurance company who was calling on me in reference to insurance work. The first three said the employer had no right to ask for a certificate from the employee; the insurance man said, as nearly as I can recall his words, "I am giving the show away, but we have no power to ask for a certificate." The employer has the right to have the employee examined at his own expense. I believe there is nothing in the Acts requiring the employee to go to a medical man. If my contention is correct,

why should any concession be made to the companies? The only reason given at the meeting was that some medical men charge sixpence each for these certificates.—I am, Sir, yours faithfully,

F. DE COVERLY VEALE.

Market Lavington August 5th, 1926.

CERTIFICATION OF INCAPACITY FOR WORK.

To the Editor of THE LANCET.

SIR,—Has it ever occurred to those responsible for certain clauses of the National Health Insurance Act that they have put into the hands of panel patients a weapon which is used alarmingly and which is now producing the new memorandum of the Ministry of Health? In these days of competition the practitioner has to keep a practice together; to lose a practice is easy, and one method of doing so which is extremely efficacious is to question too frequently the patient's demand for a certificate. Patients know only too well they can change their panel doctor daily if they desire, and they do not hesitate to tell you and do so. The remedy is to control this liberty, and when the panel doctor is thus safeguarded, and his sense of security heightened, probably his moral integrity will improve. Doubtless this has escaped observation, but a return to the six months or even three months limit for changing the doctor will be worthy of trial; it can at least do no harm.—I am, Sir, yours faithfully,

August 9th, 1926. PANEL DOCTOR.

To the Editor of THE LANCET.

SIR,—As far as this area is concerned, there has certainly been an increase of the number of references to the regional medical officer, though as there are a number of pits working my impression is that the increase is not as large as elsewhere. The circumstances are also different, as in one coalfield most of the miners have chosen a particular approved society which has an amount of sickness greatly in excess of the normal; as much as 99 per cent. of what is provided for under the Acts (so the secretary told me some time ago), as compared with 75 or 80 per cent. for other societies. In order to save themselves from bankruptcy and knowing their members well, the local officials of this society are down at once on their younger members on the sick funds whom they suspect in a time of strike. The result is a tremendous rise in the number of references, and from my own experience of such cases it is evident to me that many men fall back on sick pay as a convenient method of getting money in an emergency.

This undoubtedly has thrown on to doctors practising in such areas a very thankless and onerous work, and all the more so owing to the number of doctors who have no conscience about giving certificates. These doctors are largely "black-leg" doctors who in previous years have been got in by the miners. Though in great minority they are sufficiently numerous to make the position of the remaining doctors very difficult. This has become more so since the time when a patient could change his doctor at any time. I have come across cases where the doctor who has been in attendance has signed off a man because he was convinced of his ability to work, and by so doing has lost not merely his patient but a whole family. In one case 35 insured persons left one doctor because he signed off one man. In this case a deputation from the miners' lodge waited on the doctor and demanded that he should alter his certificate, which he refused to do. I know of the case of one insured person who, getting a final certificate from one doctor, went the same day to another doctor who gave a continuation certificate and got the insured person transferred to his list.

My sympathies are increasingly aroused for those doctors who try to do their duty under such circumstances. In a big town a doctor is not exposed to such risks or temptations, but in a mining village where the doctor's whole livelihood depends on one set of people it is very different.

I am, Sir, yours faithfully,

August 10th, 1926. GIDEON GRAY.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post. We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

7, Great Marlborough-street, London, W. 1.
August 10th, 1926.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—The Diploma in Tropical Medicine and Hygiene has been conferred upon the following candidates from the London School of Hygiene and Tropical Medicine:—

M. A. Azim, G. C. Bergman, Ellen M. Clow, R. Crawford, E. H. L. Le Clezio, H. M. O. Lester, I. G. MacGregor, V. J. G. MacGregor, I. Magdi, P. Milne, J. C. Paisley, C. L. D. Roberts, Q. M. Said, G. Sanders, V. A. Stookes, C. C. Taffs, R. W. Thomas, W. Thomson, W. S. Urquhart, B. G. Wheatley, and W. Z. C. Yuen.

At the Final Examinations of the Conjoint Board, held from July 6th to 30th, the following candidates were approved in the undermentioned subjects, but are not yet eligible for diplomas:—

Medicine.—W. M. Abdel-malek, Birmingham; A. Ali, St. Bart.'s; G. F. Andrews, Middlesex; H. W. Applin, Guy's; Rosie B. Becker, Leeds; H. O. Blauvelt, Univ. Coll.; E. J. C. Bockett, King's Coll.; E. S. Bolton, Leeds; F. W. Bradley, Guy's; Helen M. Browne, St. Mary's; Catherine F. Cameron, Royal Free; C. J. N. Cameron, Univ. Coll.; G. S. Clouston, Liverpool; M. Coll, Durham; C. R. Cooke-Taylor, Univ. Coll.; C. E. Corrigan, Manitoba; K. E. D. Dauncey and Daphne W. Dear, King's Coll.; C. H. Dhala, London; A. A. Digges la Touche, Cambridge and Leeds; Doris V. Douglas-Norman, King's Coll.; A. S. El Katib, Cairo and St. Thomas's; F. M. M. Eyton-Jones, St. Bart.'s; A. H. Gale, Univ. Coll.; Edith Giles, Charing Cross; Marion L. Grimmer, Westminster; H. L. Gulati, Charing Cross; G. S. Hall, Birmingham; S. W. Hardwick and A. C. de B. Helme, St. Bart.'s; Lilian M. J. Henry, King's Coll.; Catherine E. Hill, Royal Free; C. B. Huss, St. Bart.'s; R. F. Jayne and F. E. Kingston, London; Flora W. Lloyd, St. Mary's; P. V. MacGarry, London; D. J. MacMyn, King's Coll.; P. C. Mallam, St. Mary's; R. Maneschewitz, Guy's; Beryl Mappin, St. Mary's; J. N. Martin, Guy's; A. D. Miller, Durham; E. W. T. Morris, St. Thomas's; B. E. T. Mosse, St. Bart.'s; J. L. Newman, King's Coll.; Audrey S. Nunn, Charing Cross; Catherine J. Ormerod and N. F. Pearson, King's Coll.; Janet R. Phillips, Birmingham; Winifred A. L. Pollock, Westminster; P. N. Ray, Calcutta; E. R. Rees and E. E. F. Rose, St. Bart.'s; A. P. Ross, King's Coll.; A. V. Russell, Liverpool; C. H. St. Johnston, Birmingham; T. F. McN. Scott, St. George's; Kathleen Sheehan, Manchester; F. C. Smith and C. L. Stote, London; H. Teitelbaum, Cardiff; L. Wakeley, King's Coll.; J. Walker, Leeds; C. F. Watts, St. Bart.'s; Edith V. E. Whidborne, King's Coll.; Florence Whitrow, Manchester; Addie Wilkes, Charing Cross; N. J. Willans, Middlesex; A. G. Wilson, St. Thomas's; and A. H. Wortman, Univ. Coll.

Surgery.—V. H. Abrahamson, St. Bart.'s; R. Andrews, London; Grace L. Austin, Univ. Coll.; G. C. Babington, St. Thomas's; J. D. Bailey, St. George's; R. Bandyopadhyay, St. Thomas's; R. N. Bery, Univ. Coll.; C. P. J. Bester, St. Thomas's; G. W. Black, Middlesex; E. J. Boschi, Leeds; H. W. Bowen, St. Thomas's; W. A. Briggs and M. Bryer, St. Bart.'s; S. M. Burrows, St. Thomas's; A. Carr, Guy's; K. B. Chakravarti, London; J. A. Cholmeley and B. M. Clark, St. Bart.'s; S. L. A. Clarke, Guy's; Geraldine H. Cowle, Westminster; H. T. Cox, St. Thomas's; R. Cunningham and E. S. Curtiss, St. Bart.'s; R. P. P. Davies, St. George's; S. Douglas and Phyllis M. Edgar, Univ. Coll.; H. M. Elliott, St. Bart.'s; H. K. Evans, Middlesex; W. G. Evans, Cardiff; S. Farfel, St. Bart.'s; A. McK. Fleming, Middlesex; R. M. Gilchrist, St. Bart.'s; A. Golombek, King's Coll.; J. Gough, Cardiff; R. A. Graff, Middlesex; T. L. Griffiths, St. Bart.'s; G. S. Hall, Birmingham; E. O. Harris, Middlesex; C. A. N. Hicks, Guy's; O. Hooper, London; C. W. Hope-Gill, St. Thomas's; P. N. Lahiri, Calcutta; F. R. Langmaid, Middlesex; Greta M. Langdon, Royal Free; C. A. Levy, St. Thomas's; J. Lloyd, Cardiff; Joyce McConnell, Royal Free; G. E. Macdonald, London; J. R. Macdougall, St. Bart.'s; W. McLaren, Durham; H. E.

McLaughlin, St. Bart.'s; G. McLoughlin, Liverpool; G. S. Malik, Univ. Coll.; M. Malk and G. R. Malkin, St. Bart.'s; H. Mallinson, St. George's; H. Mannington, Middlesex; E. R. Matthews, St. Mary's; F. J. Mayne, Guy's; S. P. Meadows and J. W. Melville, Liverpool; R. J. Milbank, Guy's; Barbara H. Mitchell, Royal Free; J. C. Neely, Guy's; Greta K. Olsson, Westminster; F. G. Parker, Guy's; G. E. Parker, St. Thomas's; L. L. P. Paterson, St. Mary's; P. P. Peries, King's Coll.; R. A. Phillips, St. Thomas's; C. B. Picken, Guy's; H. A. Pim, St. Thomas's; J. C. C. Poole, St. Bart.'s; H. W. A. Post, Guy's; E. N. Price, St. Mary's; B. D. Rawlin, Sheffield; D. V. Rice, London; A. H. Richardson, Birmingham; N. Rizkalla, Manchester; E. H. Roberts, St. Bart.'s; Phyllis M. Robottom, Westminster; N. Rosen and A. H. Russell, Guy's; R. H. Scott, St. Mary's; G. C. Shepherd, Charing Cross; M. R. Sheridan, Liverpool; Catherine E. M. Siddall, St. Mary's; R. B. S. Smith, Durham; E. R. Smithard, Middlesex; W. R. C. Spicer, Guy's; Florence V. Stephen, Manchester; Kathleen M. Stuart-Harris, Royal Free; R. Stuppel, Univ. Coll.; C. N. Suter, St. Mary's; F. J. Swinton-Esher, Birmingham; C. I. Tuckett, St. Thomas's; Winifred M. Turner, Royal Free; A. C. Welch, Leeds; C. H. C. White, Guy's; R. W. Windle, St. Bart.'s; and F. H. Woolley, Bristol.

Midwifery.—G. M. Addison, St. Thomas's; B. W. Alexander and A. Ali, St. Bart.'s; H. Allan, Middlesex; Sophia A. P. Allen, Charing Cross; J. M. Anderson, Durham; G. F. Andrews, Middlesex; M. C. Andrews, Univ. Coll.; R. Andrews, London; H. W. Applin, Guy's; R. G. Apthorpe, J. M. Ashton, and G. C. Babington, St. Thomas's; Fanny H. Bachrach, St. Mary's; L. G. Backhurst and C. J. Bashall, St. Thomas's; Grace Batten, King's Coll.; Charlotte Belinky-Raguinsky, Charing Cross; S. Bernstein, Manchester; C. P. J. Bester, St. Thomas's; Constance M. H. Bishop, Charing Cross; G. W. Black, Middlesex; H. E. Blake and W. Blayney, St. Thomas's; F. W. Bradley, Guy's; J. G. Brandon, St. Thomas's; W. A. Briggs, St. Bart.'s; Ruth M. Brittan, Royal Free; Helen M. Browne, St. Mary's; M. Bryer, St. Bart.'s; C. P. Campion, Univ. Coll.; A. Carr, Guy's; R. L. Cheverton, Birmingham; B. M. Clark, St. Bart.'s; S. L. A. Clarke, Guy's; E. Colin-Russ, Middlesex; W. K. Coombes, St. Mary's; Geraldine H. Cowle, Westminster; H. T. Cox, St. Thomas's; A. T. Croucher, St. Mary's; F. H. N. Cruchley, London; A. R. Culley, Cardiff; D. Curran, St. George's; B. G. Dain, Birmingham; P. McL. Davidson, London; C. Davies, Birmingham; R. P. P. Davies, St. George's; J. Dean, St. Bart.'s; Doris V. Douglas-Norman, King's Coll.; Phyllis M. Edgar, Univ. Coll.; A. R. Edwards, Liverpool; Jessie Edwards, Charing Cross; E. A. R. Ennion, St. Mary's; D. K. Evans, Cardiff; Enid C. Evans, Westminster; H. K. Evans, Middlesex; Muriel F. M. Evans, Charing Cross; W. G. Evans, Cardiff; A. M. Fleming, Middlesex; A. E. Fraser-Smith, St. Bart.'s; H. W. Frickel, St. Mary's; A. H. Gale, Univ. Coll.; H. C. Geldard, Middlesex; J. H. Gillatt, Sheffield; N. Gindi, Birmingham; H. Girling, Guy's; Anna R. Glover, St. Mary's; P. N. Gokhale, London; A. Golombek, King's Coll.; J. Gough, Cardiff; R. A. Graff, Middlesex; C. C. Griffiths, Liverpool; T. R. Griffiths, St. Bart.'s; A. L. Gunn, Cardiff; Vivienne M. Gunson, King's Coll.; A. K. Gupta, Calcutta; V. F. Hall, King's Coll.; D. G. Hamilton, St. Thomas's; E. O. Harris, Middlesex; J. A. Hartley, St. Thomas's; Eunice M. Hatch, St. Mary's; J. E. Heggart, Middlesex; G. F. Henderson, Univ. Coll.; Kathleen Heyes, Royal Free; Marion Hook, Tufts Coll., Boston; F. S. Hubbersty, Univ. Coll.; A. L. Hyatt, Middlesex; R. Illingworth, Manchester; M. I. Jackson, Cardiff; H. M. Jaques, Middlesex; R. F. Jayne, London; J. L. G. Jenkins, Cardiff and St. Bart.'s; V. Kathirgamatamby and M. S. Katre, Madras; C. E. Kellett, Univ. Coll.; F. Kellett, St. George's; A. B. Kettle, Guy's; S. M. Kharegat, St. Bart.'s; F. R. Langmaid, Middlesex; G. Lee, St. Thomas's; H. C. Lee, Guy's; I. N. Lewis, St. George's; J. T. Lewis, Cardiff; A. W. Lilley, Manchester; Margaret I. Little, St. Mary's; D. A. Llewelyn, St. Bart.'s; Flora W. Lloyd, St. Mary's; J. Lloyd, Cardiff; J. McFadzean, Glasgow and London; W. McLaren, Durham; H. E. McLaughlin, St. Bart.'s; W. N. Maclay, St. George's; G. McLoughlin, Liverpool; M. Malk, St. Bart.'s; H. Mallinson, St. George's; R. Maneschewitz, Guy's; C. Mani, Birmingham; H. Mannington, Middlesex; T. E. Matthews, St. Mary's; F. J. Mayne, Guy's; Gwendolen E. M. Meyer, Charing Cross; R. J. Milbank, Guy's; W. E. Mitchell, Manchester; E. W. T. Morris, St. Thomas's; F. Mulvany, London; W. C. Munro, St. Bart.'s; W. D. Neill, London; J. L. Newman, King's Coll.; R. Nicklin, Birmingham; Mary O'Leary, St. Mary's; R. O'Meara, Birmingham; W. Panes, Cardiff; G. E. Parker, St. Thomas's; W. S. Parker, Dublin and Manchester; Muriel V. Paton, Royal Free; G. E. B. Payne, Univ. Coll.; R. H. Pearce, Birmingham; P. P. Peries, King's Coll.; R. A. Phillips, St. Thomas's; C. B. Picken and H. W. A. Post, Guy's; W. H. D. Priest, King's Coll.; L. M. C. Probyn, Charing Cross; W. Ralston, London; R. H. Rattray, Edinburgh and Charing Cross; B. D. Rawlin, Sheffield; P. N. Ray, Calcutta; E. R. Rees, St. Bart.'s; H. L. Rees, King's Coll.; A. H. Richardson, Birmingham; Elsie E. A. Ridley, Royal Free; E. H. Roberts, St. Bart.'s; D. A. Rolfe, Birmingham; N. Rosen and W. Rosenberg, Guy's; A. P. Ross, King's Coll.; G. P. Roxburgh, St. Bart.'s; A. H. Russell, Guy's; A. V. Russell, Liverpool; R. Rutherford, King's Coll.; J. C. Saldanha, Univ. Coll.; T. F. McN. Scott, St. George's; S. Segal, Oxford and Westminster; B. C. Singh, Univ. Coll.; L. A. P. Slinger, St. Bart.'s; D. H. Smith, London; E. R. Smithard, Middlesex; W. R. C. Spicer, Guy's; Florence V. Stephen, Manchester; C. E. R. Stephenson, St. George's; G. R. S. Stewart, Guy's; Kathleen M. Stuart-Harris, Royal Free; R. Stuppel, Univ. Coll.; Dorothy Taylor, St. Mary's; H. Teitelbaum, Cardiff; C. G. Townsend, Cambridge and Guy's; C. I. Tuckett, St. Thomas's; L. P. Tupling, Guy's; Ruth M. W. Turner, St. Mary's; E. S. Vergette, St. Bart.'s; L. S. P. Wakeley, King's Coll.; A. S. Wallis, St. Thomas's; E. Ward, Manchester; R. Watson, Univ. Coll.; M. G. Williams, Cardiff; R. A. Wilmshurst, St. Thomas's; R. W. Windle, St. Bart.'s; J. Winter, Middlesex; C. S. Wise, St. Bart.'s; and Elsie B. Wright, Royal Free.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The College will close for the long vacation on Saturday, August 14th, and reopen on Monday, Sept. 20th.

UNIVERSITY OF LONDON.—*Thomas Smythe Hughes Fund.*—A grant of £20 has been made to Dr. K. N. G. Bailey towards the cost of an investigation of certain strains of the *Bacillus coli*.

Negotiations are proceeding with the trustees of the Bedford Estate regarding the acquisition of a part of the Bloomsbury site, and at its meeting on July 21st the Senate passed a resolution:—

That the Coördination and Developments Committee be authorised to take immediate steps to secure for the University the longest possible continuance of the temporary occupation of the Malet-street site, on the understanding that the Senate will be prepared to continue negotiations for the acquisition of so much of the Bloomsbury site as is practicable having regard to the urgent importance of increased accommodation for the University at South Kensington.

HOSPITAL PENSIONS SCHEME.—The Provisional Council of the King Edward's Hospital Fund for London is inviting hospitals to submit any points of detail in connexion with the scheme on which they may desire information or decisions. These questions should, if possible, be sent before Sept. 25th, and in any event not later than Nov. 1st. Hospitals wishing to notify their readiness to participate and to send representatives to the next meeting of the Provisional Council, should write to the Provisional Executive Committee not later than Nov. 15th.

SELLING GAME FOR HOSPITALS.—The Mackintosh of Mackintosh, President of the Northern Infirmary at Inverness, has addressed a circular letter to shooting tenants in the Highlands asking them to help the collection of £100,000 for the extension of the infirmary by selling some of their grouse and other game for its benefit. The game is to be sold to a specified firm of dealers in London at ordinary market prices.

JOINT TUBERCULOSIS COUNCIL.—A post-graduate course on non-pulmonary tuberculosis will be held at Heatherwood Hospital, Ascot, Berks, from Sept. 23rd to 25th next. The lecturer will be Dr. J. G. Johnstone, the medical superintendent, and a fee of 1½ guineas will be charged. The course has been approved by the Minister of Health as ranking for grant. Applications and inquiries should be sent to the hon. secretary, Joint Tuberculosis Council, Post-graduate Courses, at 19, Brunswick-square, Camberwell, London, S.E. 5.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Starting on August 16th the Queen's Hospital for Children will hold an all-day course on the medical and surgical aspects of children's diseases. The course will last a fortnight and the entire practice of the hospital will be thrown open. A simple luncheon and tea will be provided. A brush-up course in medicine, surgery, and the specialties will be given at the Queen Mary's Hospital, Stratford, from August 23rd to Sept. 4th. Instruction will be available throughout each day, and the hospital is equipped with a new pathological department and maternity wards. Continuous weekly courses in obstetrics are given at the City of London Maternity Hospital, and the Fellowship can arrange practical courses in anæsthetics for graduates. From Sept. 6th for four weeks special lecture-demonstrations on diseases of the eye will be held at the Central London Ophthalmic Hospital, where the clinical practice of the hospital will also be available. From Sept. 6th eight bi-weekly lecture-demonstrations in psychological medicine will be given by Dr. Porter Phillips and the medical staff of the Bethlem Royal Hospital. From Sept. 13th to 25th the Infants Hospital will hold a course under the direction of Dr. Eric Pritchard for medical officers of welfare centres and others. From Sept. 20th to Oct. 1st the Westminster Hospital will provide an intensive course in medicine, surgery, and the specialties, and the National Orthopædic Hospital staff will hold an all-day course from Sept. 20th to Oct. 2nd. Copies of all syllabuses, of the General Course programme, and of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship at 1, Wimpole-street, W. 1.

INTERNATIONAL PHYSIOLOGICAL CONGRESS.—The twelfth meeting of the Congress was opened on August 3rd at Stockholm by Prof. J. E. Johansson. Sir Frederick Gowland Hopkins gave an address on the Mechanism of Biological Oxidations.

CHELMSFORD POOR-LAW INFIRMARY.—This new infirmary was opened recently. It contains accommodation for 120 beds, chiefly in four main wards, each of which has attached a large sun-room facing south. The flat roofs can be used for open-air treatment.

NEWCASTLE-UPON-TYNE ROYAL INFIRMARY.—The annual report of the house committee states that 13,281 patients were treated during 1925, the highest number on record. During the year 2000 extra beds were put up to relieve the pressure, and 17,496 accident cases were dealt with.

PRINCESS MARY AND NORTHERN HOSPITALS.—Princess Mary on August 6th opened an extension of Ripon Cottage Hospital as a memorial to King Edward and Queen Alexandra. The extension includes a Princess Mary Ward for children given by Miss Cross. Next month Her Royal Highness will open a large addition to Stockton and Thornaby Hospital which will increase the accommodation from 72 to 135 beds.

CANCER RESEARCH IN THE UNIVERSITY OF SHEFFIELD.—At a meeting of the Yorkshire Council of the British Empire Cancer Campaign held on July 26th it was agreed that the University of Sheffield should receive £10,000 over a period of five years for carrying out work on dietetics under the direction of Prof. E. Mellanby and with the approval of the Director of Cancer Research. Accommodation and full equipment will be provided out of this sum. Over £100,000 has now been subscribed to the Yorkshire Council of the British Empire Cancer Campaign, but £30,000 more is asked for.

THE FUTURE OF VOLUNTARY HOSPITALS.—On August 6th the Minister of Health opened in Glasgow a new hospital for the treatment of ear, throat and nose diseases. In his speech Mr. Chamberlain said that until the 13,000 additional beds which are needed in the voluntary hospitals of England, Wales, and Scotland are provided and the maintenance costs assured, the voluntary system would not have entirely consolidated its position. When he came to recast the Poor-law he hoped to devise a scheme which would enable the municipal hospitals, which contain 30,000 beds, to work in close coöperation with the voluntary institutions. He thought that "we might do worse than aim at the establishment of some central health authority in every district," which would decide what hospital accommodation was necessary and make sure that it was forthcoming.

DONATIONS AND BEQUESTS.—The late Mr. Charles Edward Craston, of Oldham-street, Manchester, who left a fortune of £79,462, left a large residue to the Manchester Royal Infirmary and Dispensary, St. Mary's Hospitals, Manchester, the Royal Manchester Children's Hospital, Ancoats Hospital and Dispensary, and the Manchester Royal Eye Hospital, the Hospital for Consumption and Diseases of the Throat, Manchester.—By the will of the late Mr. Thomas Harrison Evans, of Walsall, the testator left £1000 each to the Walsall and District Hospital, the Walsall Victoria Nursing Institution, the Wolverhampton and Midland Counties Eye Infirmary, Dr. Barnardo's Homes, and the Queen's Hospital, Birmingham.—The late Mr. T. Bailey, J.P., of Hessle, Hull, among other bequests, left on his wife's decease a certain large capital sum as to £10,000 to the Hull Royal Infirmary; £1500 to the Hull Royal Infirmary for the Withernsea Convalescent Home; £1000 to the Hull Royal Infirmary for the Withernsea Sanatorium for Consumptives; £10,000 to the Victoria Hospital for Sick Children, Hull; £2000 each to the Hull and Sculcoates Dispensary, the Hull Jubilee District Nursing Association; £1000 to the South Hunslet Nursing Home, Hessle, and certain sums to the Hull Royal Infirmary. And the residue of his property as to one-fifth (together with any lapsed shares) to the Hull Royal Infirmary; one-tenth each to the Victoria Hospital for Sick Children, Hull, and the Hull Blind Institution.—Mr. Edward John Dent, of Belsay, Northumberland, left £1000 to the Royal Victoria Infirmary, Newcastle-on-Tyne, to endow a cot.—Miss Violet Wills, of Haytor, has given £1000 towards the proposed hospital for Devon and Cornwall Crippled Children.—The Hon. Louisa Elizabeth Kinnaird left £2000 to the Instruction Society of the Zenana and Medical Mission.—Major Francis Barrow Pearce, C.M.G., of Shanklin, Isle of Wight, who left £24,974, after several bequests gave the residue of his estate to be divided between the Westminster Hospital, St. George's Hospital, and St. Thomas's Hospital.

LANCASHIRE'S FIGHT AGAINST TUBERCULOSIS.—The Rufford Pulmonary Hospital, near Ormskirk, was opened on August 5th. It was formerly Rufford Hall and was bought by the county in 1919. The total cost of the hospital and estate was nearly £32,000, towards which about £8000 was contributed by the Lancashire Insurance Committee and a substantial sum by the Ministry of Health. There is accommodation for 50 patients. Since the end of the war the tuberculosis death-rate for Lancashire has fallen from 107 per 100,000 of the population to 67 in 1925. Rufford makes another link in the county council's chain of four pulmonary hospitals and three sanatoriums. The county tuberculosis death-rate is now lower than the general average for England and Wales.

THE LATE DR. W. BRUCE BELL.—For many years a well-known and busy practitioner in the High Broughton district of Manchester, Dr. William Bruce Bell died at Paignton in Devon on August 4th. Born at Falkirk in 1871, he was educated at Blairlodge School and at the University of Edinburgh, where he graduated in medicine with distinction in 1893. He held medical and surgical appointments at the Edinburgh Royal Infirmary and was house surgeon at the Edinburgh Hospital for Sick Children. Settling in practice at Manchester, Dr. Bell became medical officer to the post office and medical referee to several assurance companies. In 1907 he was admitted to the Fellowship of the Royal College of Surgeons of Edinburgh. The state of his health prevented active service during the war, but he did excellent work as medical officer in charge of the Grecian-street Branch of the Second Western General Hospital. He was a keen politician, and at the time of his death chairman of the North Salford Conservative Association. He leaves a widow, a son, and a daughter.

MALARIAL PARASITES AND METHYLENE-BLUE.

METHYLENE-BLUE was used in the treatment of malaria as long ago as the 'nineties of last century and various investigations into its value have been made. Writing in THE LANCET (1920, i., 1334), D. G. Marshall recorded his experience of its use at the Edinburgh War Hospital, Bangour, where over 3000 cases of malaria were treated, and disagreed with the view that it has toxic properties. "In acute malarial attacks," he said, "it was found that though in many cases favourable results were obtained, the efficacy of methylene-blue in cutting short attacks was distinctly inferior to quinine. On the other hand, it frequently proved a valuable remedy in preventing relapses, especially in cases where quinine, administered by the mouth or by intramuscular or intravenous injections, had signally failed." He came to the conclusion that "in methylene-blue we possess a remedy of great value, and that, provided a pure supply is obtainable, it may be freely used without fear of 'toxic' symptoms resulting."

An investigation of the effects of methylene-blue on the parasites themselves has lately been made by Dr. Apostolescu, as is recorded by our Bucharest Correspondent, who gives the following account of his work.

"Dr. Apostolescu administers methylene-blue in three daily doses of 25 cg. each to patients in whose blood tertian parasites have been found. The first changes observed begin at the end of the second day, and affect only the full-grown forms; the smaller, younger forms remain unchanged. The adult organism shows diminished movement and breaking up of the protoplasm into lumpy rounded bodies, which lie in the blood-cell apart from one another, or are connected by minute bands of protoplasm and pigment granules. The protoplasm of these lumps is shrunken. The nucleus of the parasite is generally found near the periphery of the blood cell, and on staining with carmine violet its appearance is granular. Among the sporulation forms Apostolescu found, besides normal sporozoites, others which were not fully formed. The pigment is gathered in patches, and these are irregularly distributed. The chief points noted in the action of methylene-blue on the tertian forms were destruction of the protoplasm and absence of alteration of the chromatin. In the parasite of æstivo-autumnal fever no changes were observed. In the crescent forms there was shrinking and granulation of the protoplasm. He noticed a more equal staining of the whole parasite than normal and that the pigment granules appear coarser and are grouped in an irregular mass, which projects from the surface of the shrunken protoplasm. The destructive process of the protoplasm of malarial crescents goes on until there is nothing of the parasite left except the pigment."

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

AUGUST 16th to AUGUST 21st.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E. All-day course for two weeks. Work available in all departments of the Hospital. Further particulars from the Secretary.

POST-GRADUATE HOSTEL, Imperial Hotel, Russell-square, W.C.

MONDAY, August 16th.—9 P.M., Mr. Donald Armour will open a Discussion on Head Injuries.

THURSDAY.—9 P.M., Dr. Harold Scott will open a Discussion on Some Points in Tuberculosis among Wild Animals in Captivity.

Appointments.

SUTHERLAND, D. P., M.B., B.S. Lond., has been appointed Honorary Lecturer in Clinical Tuberculosis at Victoria University, Manchester.

Certifying Surgeons under the Factory and Workshop Acts: McCOULL, G., M.B., B.S. Durh. (Wylam, Northumberland); McWHIRTER, J. G., M.B., Ch.B. Glasg. (Whithorn, Wigtown).

Vacancies.

For further information refer to the advertisement columns.

Barnet, Wellhouse Hospital.—Asst. Res. M.O. £150.

Birmingham City Mental Hospitals.—Asst. M.O. £350.

Bolton Infirmary and Dispensary.—H.S. £150.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Bristol General Hospital.—H.P.'s, H.S.'s, &c. Each at rate of £80.

Bristol, Ham Green Fever Hospital and Sanatorium.—Asst. Res. M.O. £300.

Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £80.

Bristol University.—Asst. to Professor of Surgery. £400.

Cardiff, Prince of Wales's Hospital.—H.S. £100.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Essex, Administrative County of.—Asst. County M.O.H. £600.

Halifax County Borough.—Tuberculosis O. £650.

Halifax Royal Infirmary.—Fourth H.S. At rate of £100.

Huddersfield Royal Infirmary.—Jun. H.S. At rate of £150.

Hull Institution and Infirmary, Anlaby-road.—Asst. Res. M.O. £300.

Leicester Royal Infirmary.—Second H.P.

Leicestershire County Council.—County M.O.H. £1200.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Manchester Royal Infirmary.—Asst. Surg. O. £75.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. M.O. £300.

Northampton General Hospital.—H.P. and H.S. Each at rate of £150.

Poplar Hospital for Accidents, East India Dock-road, Poplar, E.—Second Res. O. £175.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Dist. Res. M.O. Also Asst. Res. M.O. Each at rate of £80.

Queen's Hospital for Children, Hackney-road, E.—P. for Skin Dept. Also H.P. and H.S. Each at rate of £100.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Rhondda Urban District Council.—Dental Surg. £500.

Royal Chest Hospital, City-road, E.C.—Res. M.O. At rate of £150.

Royal Northern Hospital, Holloway-road, London, N.—Cas. O. At rate of £90.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salisbury General Infirmary.—H.S. £150.

Sheffield University (Dept. of Pathology).—Asst. Bacteriologist. £300.

Watford, Herts Peace Memorial Hospital.—Res. M.O. At rate of £150.

West London Hospital, Hammersmith-road, W.—One H.P. and Two H.S.'s. Each at rate of £100.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Musselburgh (County of Edinburgh), Falkland (Fifeshire), and Twickenham (Middlesex).

Births, Marriages, and Deaths.

BIRTHS.

ABEL.—On July 31st, at Adelaide-road, N.W., the wife of A. Lawrence Abel, M.S., F.R.C.S., of a son.

FRANCIS.—On August 4th, at Lauriston House, Hereford, the wife of Cyril Francis, M.D., B.S., L.R.C.P. Lond., M.R.C.S. Eng., of a son.

SHORE.—On July 31st, at Devonshire-street, W., to Janet, the wife of Dr. T. H. Gootwyck Shore—a daughter.

MARRIAGES.

BEITH—PELL.—On August 7th, at All Saints, Leicester, Dr. Andrew Edwin Beith, to Rose Bigot, elder daughter of Dr. and Mrs. William Pell, Leicester.

HART—McINTYRE.—On August 9th, at St. Mary Abbot's, Kensington, Charles Herbert Hart, M.B., to Constance Cecilia, only child of Mr. and Mrs. John McIntyre, of Cape Town.

LANE—DUPRÉ.—Were married on August 3rd at St. Brelade's Church, Jersey, Cyril Rickword Lane, M.B., youngest son of Mr. and Mrs. H. Lane, of "The Querns," Cheltenham, to Margherita Lucille, second daughter of Mr. and Mrs. G. Luce Dupré, of Corbière, Jersey.

DEATHS.

BELL.—On August 4th, at Paignton, South Devon, William Bruce Bell, M.B., Ch.B., F.R.C.S. Edin., late of Brae Lossie, Higher Broughton, Manchester.

COLE.—On August 10th, at 25, Upper Berkeley-street, W., from angina pectoris, Robert Henry Cole, M.D., F.R.C.P.

O'HARA.—On August 6th, at Carysfort-road, Boscombe, Colonel William O'Hara, I.M.S. (retd.), aged 74.

OWLES.—On August 4th, at Folkestone, James Allden Owles, M.D., in his 86th year.

REED.—On August 2nd, at Montague Villas, Salisbury, peacefully in his sleep, Surgeon-Captain John Charles Groscort Reed, R.N. (retd.), aged 53.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE Kent Local Medical and Panel Committees propose to move a resolution at the forthcoming annual Panel Conference to the effect that "in the opinion of this Conference the keeping of records of attendances, visits, and certificates by each individual practitioner is neither necessary, useful, nor desirable, and should be abolished in favour of a method by which the statistical material required can be obtained from selected practitioners who are in a position to make accurate returns."

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Notes, Comments, and Abstracts.

THE PATHOLOGICAL SERVICE OF THE GENERAL HOSPITAL.

A PATHOLOGICAL department is now recognised as essential to every hospital, but there is still uncertainty about the part it should play in the hospital economy. In different places and under different systems there are wide variations in its organisation and in its relation to other branches of medical practice. In a paper read before the annual meeting of the British Hospitals Association on June 25th Dr. S. C. Dyke discussed the means of securing efficient pathological service in the smaller general hospitals and offered suggestions on the coördination of such a service with insurance and private practice in its area. The following summarises some of the views he expressed.

The Hospital Pathologist and Outside Practice.

After referring to the value of accurate records, which he described as for the most part sadly lacking in the smaller hospitals, Dr. Dyke turned to the pathologist's work outside the hospital itself. The work done for the wards, he said, must be the justification for the existence of the laboratory. The laboratory will, however, be open to the receipt of work from the outside and this private work should form a source of income to pathologist and hospital alike. The most satisfactory arrangement seems to be that under which the pathologist is paid a salary or retaining fee from the hospital, is allowed to use the laboratory for his own work, and receives a proportion of the fees coming in for services rendered.

The work sent from outside will fall into two classes—that done for private practitioners and that done for public bodies. It is very desirable that the pathological department of a general hospital should be a centre for the exchange of views among medical men and a place to which they may take the problems occurring in their practices for such light as the pathologist can throw upon them. Sporadic visits from medical men may interfere with the smooth running of the laboratory, but they are to be regarded as an essential part of the daily round. The laboratory, in fact, must be looked upon as instituted not only for the benefit of the hospital, but also for that of the practitioners of the surrounding district. The work done for public bodies will be largely on contract and will consist of such items as the examination of throat swabs for diphtheria, of sputum for tubercle bacilli, and so forth. Such work will usually be catered for at special rates. It is advisable that the laboratory should not be swamped with work of this sort, but a certain amount of it is very desirable as bringing a steady and certain income into the department. Most local authorities arrange for the performance of examinations of this sort free of charge to the practitioners, the cost being a charge upon the rates.

Important as this work is, however, it should not be allowed to overshadow the other activities of the laboratory. A tendency has arisen, and is unfortunately growing, to regard a pathological laboratory as a sort of slot machine which, in return for a specimen, be it a swab or a bottle of sputum or of urine, will supply a diagnosis and even a cure in the shape of a jorum of vaccine. Such is not its function. In many cases the pathologist faced with a specimen can have no idea in what direction the investigation should proceed without information from the clinician or without himself seeing the patient. Coöperation between pathologist and medical staff is necessary for the efficient working of the practice of the hospital, and the rule applies exactly to the relations of the pathologist to the practitioners served by the hospital and its laboratory.

In many instances local authorities have provided their own laboratories for the performance of such pathological work as is paid for out of the rates. So long as this step results in saving the ratepayers' money it cannot be regarded as other than admirable, but in one recent experiment the result was to deprive the laboratories of the general hospitals in the county of a large part of their income, to burden the county rates with an expenditure for which there was no justification, and to give a further fillip to the unfortunate tendency to expect the State to pay for everything. In the majority of instances, it should be said, no such clash has arisen between the laboratories of the general hospitals and those supported out of the rates, for county and municipal laboratories usually confine their activities to the sphere of public health. If local authorities generally were to throw open their laboratories to all the practitioners in their area for the free performance of investigations of all kinds, in the long run it would not bring about any improvement in medical practice. On the contrary, such a step would distract the specialists in the pathology of public health from their own field and would ultimately have the inevitable effect of rendering the ground work of medicine a State department. It seems inadvisable that any branch of medicine—and in particular such an important one as pathology—should become bureaucratised.

Panel Practice.

There is every indication that in the near future the laboratories of the general hospitals should be able greatly to extend their sphere of usefulness. It is one of the anomalies of the panel system that, although from its inception it has given every facility for the treatment of disease, in so far as treatment can be carried out by bottles of medicine, it has provided no facilities for diagnosis. For 16 years now the panel practitioner has been left to make his diagnoses as best he can, but one of the steps recommended by the recent Royal Commission upon the National Health insurance system was that provision should be made for pathological investigations for panel patients. The need for such provision is obvious and offers the sole excuse for such a step on the part of a county council as offering to perform such investigations in its own laboratory. To offer to perform them free of charge is, however, to take liberties with the ratepayers' money. For the performance of such investigations for panel patients ample funds exist in the reserves of the approved societies, while private patients have always been in the habit of paying according to their means. As pointed out above, it is further desirable that pathological investigations concerning the individual rather than the national health should be made in the laboratory of the general hospital to which the patient will himself come for treatment when he is ill.

In some areas provision has been made in advance of any alterations in the panel system for the investigation of panel cases in the laboratories attached to the general hospitals. Thus the Chester Royal Infirmary undertakes pathological investigations for panel patients and their dependents at something below the rates charged to private patients, and Wolverhampton and Staffordshire General Hospital has recently inaugurated a similar scheme in association with the Wolverhampton panel committee. Under this scheme certain examinations will be performed at half rates for panel patients and their dependents.

The justification for such a step exists in the fact that in the vast majority of cases no examination would be made were full fees charged. Some such arrangements will undoubtedly become general when the recommendations of the recent Royal Commission are given effect. This being so, there are two points to which all interested in the welfare of the voluntary hospitals should give their attention. These are :—

1. That reasonable fees shall be paid to the departments for the work done.

2. That all such investigations shall be carried out in the laboratory attached to the general hospital serving the district in which the patient resides.

These two points are mutually dependent. In the absence of some regulations concerning them it is inevitable that a large number of the investigations under the scheme will be done at cut rates in commercial laboratories having no connexion with the hospital to which the patient will go when in need of hospital treatment. This appears undesirable from the patient's point of view.

The first point might form the basis for consultations between the British Hospital Association and the Ministry of Health. Hospital pathologists have no representative body which might draw up a scale of fees for pathological work, but in conjunction with the secretaries of their hospitals, who are also concerned, they would be willing to give their assistance in drafting such a schedule for submission to the Ministry. The suggestion that all pathological investigations be carried out in the laboratory of the general hospital serving the district in which the patient resides is of equal or greater importance. Such an arrangement would be of enormous benefit to the voluntary hospitals throughout the country, in that it would assist them in the equipment and maintenance of efficient pathological departments. Apart from the question of adequate payment, there is no measure more calculated to improve the status of pathology and by so doing to raise the standard of medicine generally throughout this country.

THE mother of the late Sir Ernest Shackleton and her daughters are in straitened circumstances, and, as Sir Ernest Shackleton's father was a medical man, it is right to commend to the notice of our readers a fund which has been started on behalf of the widow and family. Contributions should be sent to Mr. Percival Hardy, 46, Parliament-street, S.W.

PUBLIC HEALTH IN BECHUANALAND.

THIS Protectorate is a country of British South Africa, in the centre of the vast tableland stretching north to the Zambesi, and the population at the census of 1921 was 152,983, of whom 1743 were whites, 52 Indians, 1003 coloured, and 150,185 natives. Mr. C. L. O'B. Dutton, Government Secretary, in his report for 1924 states that the health of the territory was very good throughout the year. The relative incidence of disease remains the same; malaria, syphilis, and bronchial affections prevailing in the order given. The high place occupied by catarrhal diseases of the chest cannot, however, be assigned to them as separate entities. They are often the concurrent or remote manifestations of malarial infection, which thus, as always, maintains its great preponderance. There were no acute, severe, or widespread outbreaks of fever or epidemic disease except eight cases (one European) of cerebro-spinal meningitis which occurred at different centres, of which seven terminated fatally. During the year the rainfall was the heaviest within the last two decades. This would presume, prima facie, an increase in malarial incidence. But it is not necessarily in seasons of heaviest rainfall that fever and its attendant complications and sequelæ take their heaviest toll—it is in seasons of drought and scarcity with their consequent lowered standards of living and powers of resistance. With the heavier rainfall there is a corresponding improvement in grazing conditions and an abundance of staple agricultural products.

There is evidence, in the steady increase of applications for antisyphilitic remedies at the various centres throughout the territory, of a growing eagerness to benefit by the provision of free treatment of venereal disease. At Molepolole alone, where a Government dispenser has been in charge for the past nine months, 500 cases have been treated. From Mochudi, where in the absence of a Government dispensary the issuing of medicines is entrusted to the representatives of the Dutch Reformed Mission, the reports are equally favourable. Although no statistics have been submitted, the nurse in charge of the Mission dispensary reports that the demand for free treatment is very great, a fact confirmed by the Gaberones medical officer during his monthly visits. At Kanye 464 cases have been treated. A fresh extension of the work is contemplated in visits by the district surgeon of Kanye to Moshupa and Manyana. In the northern part of the territory, owing to changes and interruptions throughout the medical service, exact statistics are not available. But the reports from various reliable sources are all encouraging, and, with the gradual completion and stabilising of the medical service, and increased resources for accumulating stocks of the necessary novo-arsenical preparations, the possibilities in this particular field are very great and to a large extent realisable.

The death of one of the medical officers during the year led to a certain amount of disorganisation. The consequent changes and service requirements have been met by a temporary arrangement, the permanent readjustment to be postponed pending the selection of a suitable whole-time officer. An important step in the extension of the medical service has been the appointment of a medical officer to N'gamiland. Discussions have taken place as to the possibility of making a beginning with the building of small modern hospitals at one or two of the principal centres, and, financial circumstances permitting, provision will be made on this behalf in the next estimates. The daily average of patients treated at Gaberones during the year was 7·78, of whom 0·01 were Europeans, making the total number of treatments 2346.

The prevalence of plague, bubonic and pneumonic, in certain portions of the Union contiguous to the territory, and particularly at De Aar and Kimberley, which are situated on the direct line of railway from the south, prompted the administration to take certain precautionary measures, both within and without the territory. For some time past the most effective trap procurable both for rats and mice has been in use in all public offices, stores, and buildings, and monthly returns of captures are rendered to, and collated by, the principal medical officer. The European officials and other residents of the territory have also been made alive to the need for destroying rodents wherever seen. Particulars as to the life-history of the flea and the several methods of destroying the insect have been disseminated amongst the inhabitants, European and native, with a plain intimation that fleas were the carriers to human beings of plague germs from plague-infected rodents and other furred animals, and an intensive campaign of destruction was encouraged. The P.M.O. has under consideration a scheme for preparing and assembling in advance all the essential elements of an organisation which would be capable of dealing with plague in territory should an outbreak suddenly occur. In this respect he is fortunate in having the assistance temporarily of Dr. P. Targett Adams, late medical officer of health for the Orange Free State, whose experience of plague in the Union is almost unrivalled.

HAY FEVER, TRUE AND FALSE.

THIS year hay fever seems to have been discussed more than usual in the press and in lay circles, but it would be rash to draw the conclusion that it has been more prevalent. Some twenty years ago it was customary for practitioners to dismiss this distressing complaint as mere neurosis, of which any worthy citizen ought to be rather ashamed. Nowadays, hay fever is as respectable as a broken leg, and just as any acute fever is liable to be called influenza, doctors are tempted to diagnose any rhinorrhœa as hay fever. We may point out that for this year true hay fever has ended, for it only lasts so long as the pollen cloud lasts over England. In the south this period extends almost exactly from May 20th to July 15th—a little earlier or later according to the weather, and certainly a little later this year. But it varies less than might be imagined, since it depends more on length of daylight than on temperature. Symptoms do not coincide exactly with these dates for two reasons: (1) conditions are described as hay fever without adequate reason; (2) concurrent illness may supervene and blur the outlines of true hay fever. Anyone called on to treat "hay fever" after the middle of July should first consider whether pollen ever had anything to do with the symptoms, and if so, what other sensitisation is now keeping them going; infected throat, teeth, and tonsils—and possibly infections elsewhere—may be incriminated. Other possibilities must be borne in mind, including substances in food or in atmospheric dust—e.g., horse-dung to those who are horse sensitive. In the treatment of pseudo hay fever, specific therapy can be expected to do little or nothing unless a more accurate diagnosis can be made. There remain for consideration shock tactics, suggestion, and ointments or washes containing mild local anæsthetics or adrenalin—according to the taste or idiosyncrasies of the practitioner.

AN IMPROVED SPOON: THE "CACHON."

THE accident of a spoon slipping into a plate of soup or other liquid or semi-liquid food is annoying, and to prevent such contretemps "cachon" table ware has been devised by Messrs Joseph Gilbert and Sons, of Sun Works, Bissell-street, Birmingham. At the handle end of the spoon or fork, and underneath it, a slight projection, technically called a nib, is made at right angles to the plane of the article in such a manner as to prevent it slipping beyond the edge of the plate or vessel in or on which it may be resting. The "nib" is in no way conspicuous, does not affect the balance or handling of the article, and does not detract from any beauty of design that it may possess. Table spoons or forks, salad servers, butter knives, dessert spoons or forks, and tea spoons are made with the non-slipping device in Era Silver, Nuva Plate, Gilbert Plate, and in other materials for table ware manufactured by the firm.

A HASTY GENERALISATION.

THE following reached us unvouched for by signature, but it is worth printing as showing how the estimate of one angry man, probably in connexion with one piece of tactlessness, may produce sweeping denunciations, damaging to the medical profession:—

The Infirmaries and Hospitals.

All over the country these institutions are getting into the control of cliques of unscrupulous guinea-snatching doctors.

Doctors get put upon the staffs of hospitals, through various forms of influence, nepotism, freemasonry, and the like, seldom or never through any special merit.

By or through their connexion with a hospital these men are enabled to pretend to be specialists, and to charge three guineas a visit or even a consultation. There is no such thing among them as a specialist in surgery, medicine, or midwifery; indeed, many of these frauds have been common panel doctors and they would remain such but for their hospital appointment.

People who can visit these humbugs and pay them three guineas can get a bed without any waiting, often next day.

Poor people have to wait months and mostly go into the workhouse wards. Mostly they go unrelieved.

These hasty generalisations, though sincere, are mischievous. The development of local consulting, based upon local esteem, is exactly the outcome of panel practice which is most to be desired. Patients seen privately are often found to need prompt hospital treatment, and no general indictments of hospital administration or professional conduct can be founded upon this situation. No doubt abuses occur, but certainly not to the extent that warrants an attack of the above sort, which we publish in order to deny its accuracy as a series of generalisations. Of the particular episode which led up to the communication we know nothing.